

ESTABLISHED 1888 • PIONEERS OF VACUUM STEAM HEATING

Webster

Systems of Steam Heating

WARREN WEBSTER & COMPANY • CAMDEN, NEW JERSEY

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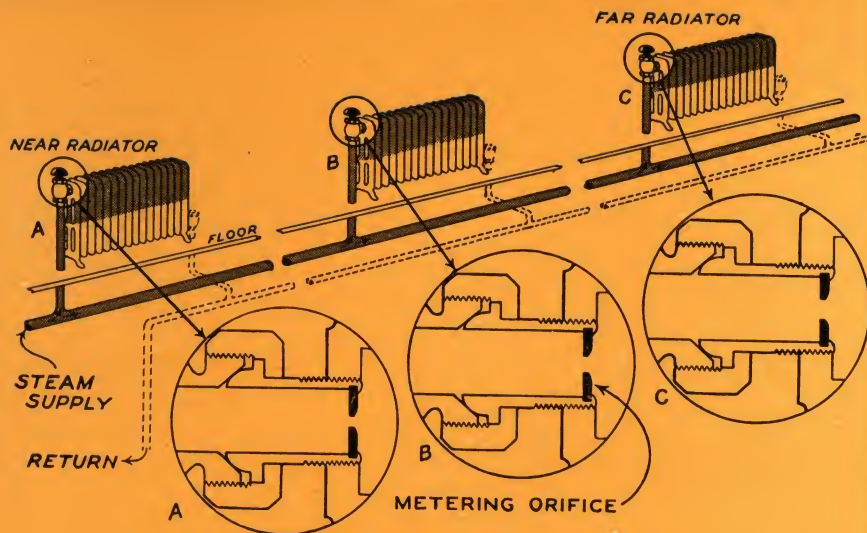


Fig. 1. Diagrammatic Sketch of the Improved Webster System

Showing how "pressure drop" is equalized or balanced by installation of standard metering orifices of proper size. While cast-iron radiation is illustrated the same heating result is attained with convection heating units

IMPROVED WEBSTER SYSTEMS OF STEAM HEATING

THE Improved Webster Systems are two-pipe vacuum or "vapor" systems of steam circulation with the addition of accurately sized metering orifices at the radiator supply connections, and, in such installations as require it, intermediate metering orifices at points in branch mains. Metering orifices, when properly selected and installed, effect even distribution of steam to all parts of the heating system and permit the successful application of a centralized control.

How Even Distribution Is Accomplished

In the older types of systems the nearest radiators become warm first while the farthest radiators do not begin to get warm until the others are filled. Now, in the Improved Webster Systems, all radiators get steam at the same time and substantially in proportion to the need for steam. In Fig. 1 it can be seen that the metering orifice in radiator A is quite small. When steam reaches this radiator the amount

that can enter is therefore restricted. As a result the remaining steam quickly flows on through the piping to the next radiator B. Here the opening is slightly larger because the pressure of the steam by the time it reaches radiator B is lower. So it goes, radiator by radiator, to the farthest point. The "pressure drop" to each radiator has been equalized or balanced by installation of the correctly sized metering orifice. The result is that each radiator receives a proportionate amount of steam. When radiators are completely filled with steam Webster Thermostatic Traps close to prevent escape of steam into returns.

Flexible in Application

Improved Webster Systems are basic systems of steam circulation and use steam from boilers, engine or turbine exhaust, street lines, etc. They can be used with almost all types of direct radiation generally employed in steam heating practice.

Webster Radiator Valves and Thermostatic Return Traps are used on all radiators and heating units, and Webster Drip Traps where necessary on mains and risers. Webster Boiler Return Trap Equipment (see page 17) is used in open return and gravity installations, except where power driven condensation pumps are necessary. Steam or electric driven vacuum pumps are used on the returns of vacuum systems.

Improved Systems Are Controllable

An Improved Webster System without any control will be worthwhile because of its solution of distribution problems. But, to assure steam consumption economy, together with maximum comfort, *control of heating system operation* is the vitally important factor. The mere installation of a so-called "key-room" thermostat to open a burner or valve does not give adequate control of operation. To start with, the system must be controllable. The Improved Webster Systems are controllable by the application of a single, central control which assures economy of steam consumption and moderates excesses of over-heating and under-heating.

Where definite temperature control is desired at each individual radiator, the temperature control equipment may be used in conjunction with Improved Webster Systems.

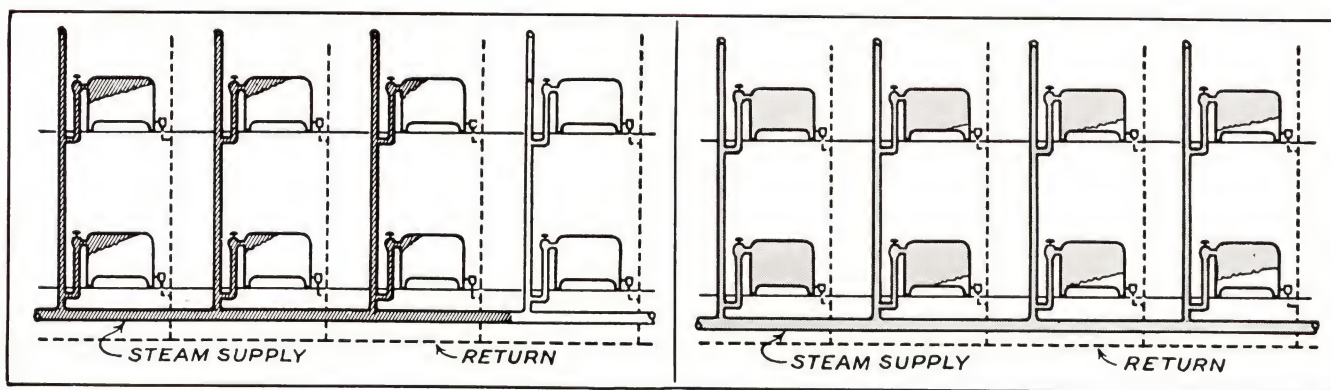


Fig. 2. Unorificed systems often result in uneven steam distribution as shown in the two sketches above. During mild weather (see sketch at left) radiators near the source of supply receive most of the steam while far radiators get little or none. Even in colder weather (see sketch at right) when pressure is increased,

far radiators may not be completely filled although near radiators are filled and overheating. The Improved Webster Systems using Webster Metering Orifices correct these faults and all radiators are evenly filled as shown in Fig. 1 at top of page.

WEBSTER E-3 ELECTRIC MODERATOR CONTROL

A Service Bulletin giving complete mechanical details and operation and maintenance instructions is available to supplement the brief description on this page and the next. Ask for Service Bulletin S-951.

Webster Central Controls

Webster Central Control Systems are provided in several types for use with Improved Webster Systems of Steam Heating. All types give these advantages:

- (1) Prevent excesses of overheating and underheating characteristic of uncontrolled heating systems and of systems having only ordinary "on-and-off" controls.
- (2) Provide practically continuous heat delivery from radiators with either gravity or vacuum operation.
- (3) Eliminate loss due to careless or excessive window opening by placing steam consumption under control of operator.
- (4) Facilitate proper operation, the real basis for heating economy.

Webster Type E-3 Moderator Control

This type of control automatically varies the amount of steam supplied to the entire heating system in accordance with changes of outside temperature. It is provided in a standard arrangement (Fig. 3) using a single Webster Main Steam Control Valve. For most installations of average size where occupancy conditions are uniform throughout the building, the single valve arrangement is adequate and will be preferred because of lower first cost. Or two valves may be provided with a dual Outdoor Thermostat. For large installations, particularly where occupancy conditions vary in different portions of the building or in different buildings in a group making a multiplicity of valves desirable, the Webster Type EH or Air Moderator Controls on pages 5 and 6 are recommended.

How It Works

For the purpose of describing the Type E-3 Moderator System, Fig. 3 will be used. Steam may be delivered from high or low pressure boiler or from any other source. Return piping may be either "open" or "closed," as the E-3 Moderator Control regulates the pressure difference and will function equally well regardless of whether the pressure in the return piping is at atmosphere or below.

The Main Steam Control Valve is adjusted automatically by the electrical Moderator Control apparatus. The valve is motor-operated. The Moderator Control serves simply to reverse the direction of the motor, causing it to move the valve in the closing direction when less steam is required and in the opening direction when more steam is required.

The electrical Outdoor Thermostat provides the automatic "Control-by-the-Weather" feature varying steam flow in accordance with changes in outdoor temperature. At 70° F. outdoor temperature the Main Steam Control Valve will close almost entirely. At the extreme of 0° F. outdoor temperature (or -10° F. or +10° F. etc., depending on climate) the Outdoor Thermostat will cause the valve

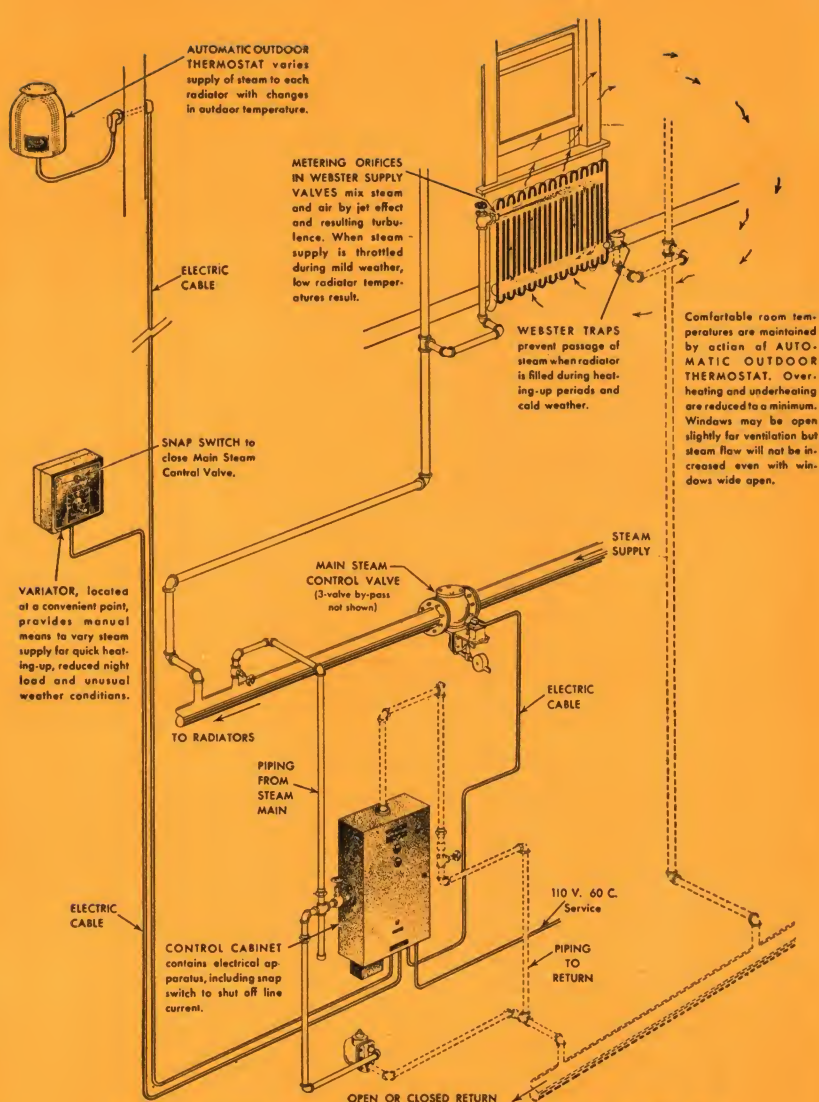


Fig. 3. Standard Arrangement of Improved Webster System with Webster Type E-3 Electric Moderator Control, Using a Single Main Steam Control Valve

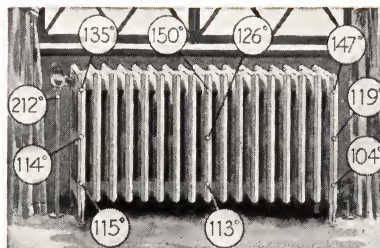


Fig. 4. Low Radiator Temperatures Obtained in Cast Iron Radiators with Webster Moderator Systems Throttling Steam Supply During Mild Weather.

These low temperatures are produced by "jet" effect of orifice (see Fig. 3) which causes steam and air in radiator to mix. Average radiator temperature is 125° F.

to open sufficiently to keep the radiators filled with steam. At intermediate outdoor temperatures, the Main Steam Valve is adjusted proportionately and radiators are fractionally or partially filled with steam. The position of the Control Valve thus selected automatically by the Outdoor Thermostat may be advanced or reduced by the Variator to give more or less steam than is called for by the outdoor temperature.

Compensation for Pressure Changes

Fluctuations in boiler pressure, in vacuum, in number of radiators turned on, etc., change the pressure difference in the heating system from that called for by the joint action of Outdoor Thermostat and Variator. These changes in pressure difference are compensated for automatically by a pressure-actuated mercury tube in the Control Cabinet which adjusts the throttling effect of the Control Valve.

WEBSTER TYPE E-3 MODERATOR CONTROL EQUIPMENT



Fig. 5. Automatic Outdoor Thermostat Is $8\frac{3}{8}$ In. Diameter by $11\frac{1}{2}$ In. High

Automatic Outdoor Thermostat

Provides automatic "Control-by-the-Weather." It is simple, rugged and compact. Interior parts are mounted on cast iron base and sealed by aluminum housing. Entire device is protected from direct rays of sun by an aluminum shield. Ample space between shield and housing is provided for air circulation. Thermostatic element is a bimetallic coil expanding and contracting to move a contact arm over an electrical resistance. Change in resistance energizes control valve motor which adjusts the Control Valve. At 70° F. or higher outdoor temperature the Control Valve is completely closed. Single Thermostat for one-valve control; Dual Thermostat for two valves.

Installation—Placed on roof or outside wall using vertical pipe stand or horizontal bracket of conduit with conduit. Fittings for mounting not furnished with Thermostat. Must be connected to Control Cabinet by two No. 14 rubber covered, double braided wires to carry 24 volts. Approx. wt. is 45 lbs.

Variator

A small metal cabinet containing (1) adjustable knob for manual control of the steam supply and (2) snap switch to close Main Steam Control Valve. One required for each valve controlled.

Operation—Modifies action of Outdoor Thermostat. Turning knob to left reduces steam supply; turning right increases supply by desired *percentage*. Used principally for heating-up during early morning hours and for reduced evening or night heating. Occasionally for exceptional weather conditions such as winds, hot sun, cloudiness, etc. However "normal" setting will take care of average conditions of wind, sun and shade.



Fig. 6. The Variator Is $5\frac{5}{8} \times 5\frac{5}{8} \times 4\frac{7}{8}$ In. in Size

Installation—Can be located on wall at any convenient operating station—the boiler room, superintendent's office, beside private exchange, etc. Adjustment is simple and may be made by

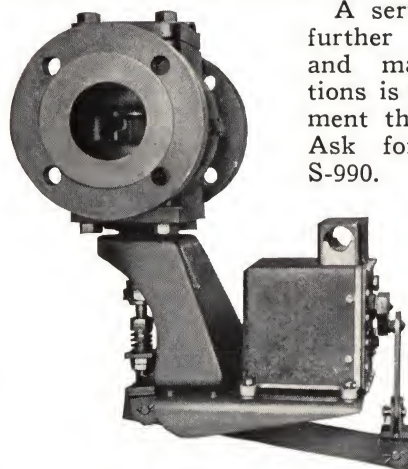
Main Steam Control Valve

stenographer or telephone operator. Must be connected to Control Cabinet by seven No. 14 rubber covered, double-braided wires to carry 24 volts. Approx. wt. 15 lbs.

Globe pattern, semi-balanced, double-seated disc type. Valve seats are Monel Metal while discs are phosphor bronze. Bodies are cast iron made with the best gray iron from metal patterns. All valves have flanged bodies but companion flanges are not included.

A standard induction type reversing motor opens and closes the valve through lever and linkage.

Installation—Installed in steam main usually with conventional 3-valve by-pass. One-valve by-pass may be used where considered adequate. Must be connected to Control Cabinet by five No. 14 rubber covered, double-braided wires to carry 24 volts for valve sizes up to 8 inches inclusive; three wires through relay (24 volt to 110 volt) for 10 and 12 inch valve sizes.



A service bulletin giving further mechanical details and maintenance instructions is available to supplement this brief description. Ask for Service Bulletin S-990.

Fig. 7. Type E-1M Main Steam Control Valve. Made in $2\frac{1}{2}$ In. to 8 In. Sizes. Type E-1 for 10 In. and 12 In. Sizes

Control Cabinet

Contains standard electrical apparatus such as transformers, relays, fuses, etc., in addition to specially designed mercury contact U-tube. Has hinged cover for accessibility, with lock. Includes pilot light to show when control is in service and blinker light to show operation of Control Valve. Also a snap switch for shut-off of line current. One required for each valve controlled.

Installation — Bolted or screwed to wall near Control Valve. Electrical service (100 watts, 110 volts, 60 cycle a-c) to operate control system is brought to this cabinet. For d-c. current, a Rotary Converter should be provided. Piping connections made from cabinet to steam and return mains. A Webster Size 00026-O Drip Trap is required. Approx. wt. 85 lbs.



Fig. 8. Control Cabinet Is $16 \times 28 \times 6$ In. in Size

WEBSTER EH ELECTRIC MODERATOR CONTROL

A Service Bulletin giving complete mechanical details and operation and maintenance instructions is available to supplement the brief description below. Ask for Service Bulletin S-961.

With this control the heating of any number of buildings or zones served from a single steam source may be controlled from a single central operating station, providing substantially the same heating effect as other types of Webster Moderator Systems. It is therefore advantageous for colleges and universities, hospitals, religious and public institutions, housing projects, etc.

The Type EH Moderator System provides means at the central operating station for completely shutting off heat to each zone, building, or group of buildings, depending on the arrangement installed. If some buildings require more steam or less steam during certain periods, this can be accomplished also.

Undue fluctuation in demand on boiler and central station load is avoided by automatically synchronizing the operation of the several Main Steam Control Valves in each installation. There is no undue fluctuation in boiler pressure or in rate of return of condensate to boiler or to point of disposal.

Equipment Required

Is electrical and consists of Webster Outdoor Thermostat, Control Cabinet and Steam Control Valve equipment. A diagrammatic arrangement for a group of four buildings, each served by its own Main Steam Control Valve, is shown in Figure 9. An Outdoor Thermostat is located on the outside wall or roof of the central operating station. A Control Cabinet placed at a convenient point in the operating station is connected to the Outdoor Thermostat by 3 No. 14 wires. A Main Steam Control Valve, with an accompanying Relay Cabinet, serves each building (or group of buildings if desired). These Valves are connected to the Control Cabinet by low voltage wires in cables which can be run in the steam main tunnel, underground in "Parkway" cable or in conduit, or overhead on poles. Standard electrical type cable terminal boxes are used where required.

The automatic Outdoor Thermostat is similar to that used with the Webster Type E-3 Moderator System and is illustrated and described on page 4.

The Control Valves are Webster Type E-1M or E-1 Valves (see Fig. 7) which, in conjunction with Pressure Controllers, maintain a constant pressure difference between supply and return mains.

The Control Cabinet contains the mechanism which produces the "pulsating flow" operation, opening and closing the Control Valves in accordance with the cycle selected by the Outdoor Thermostat and Variator. Snap Switches for opening and closing the Control Valves, other switches and pilot lights for the various electrical circuits, as well as the outdoor temperature indicator are all included.

A small by-pass is often placed around the Webster Main Control Valve to heat the mains in the morning or after a shut-down. A small motorized valve may be placed in this by-pass to shut off steam when latter is not required.

How It Works

Steam passes into system through Webster Main Control Valve in pulsations of varying length but at uniform pressure difference. The flow starts when Control Valve is open and ends when it is closed. For the average building, the Control Valve completes its cycle of operation in from eight to fifteen minutes, the time being selected for the particular installation. For purpose of explanation, assume a cycle of eight minutes. During periods of coldest temperature, Main Valve may be open continuously. If outside temperature rises somewhat it may be open seven minutes and closed one minute. If temperature rises still further, the open period becomes six minutes and the closed period two minutes. And so on, until during very mild weather, Main Valve will be open one minute or less and closed seven minutes or more. There are certain applications which may require a relatively longer cycle. One-pipe systems, unorificed systems or systems in which mains are too small or trapped beyond correction might use a considerably longer cycle.

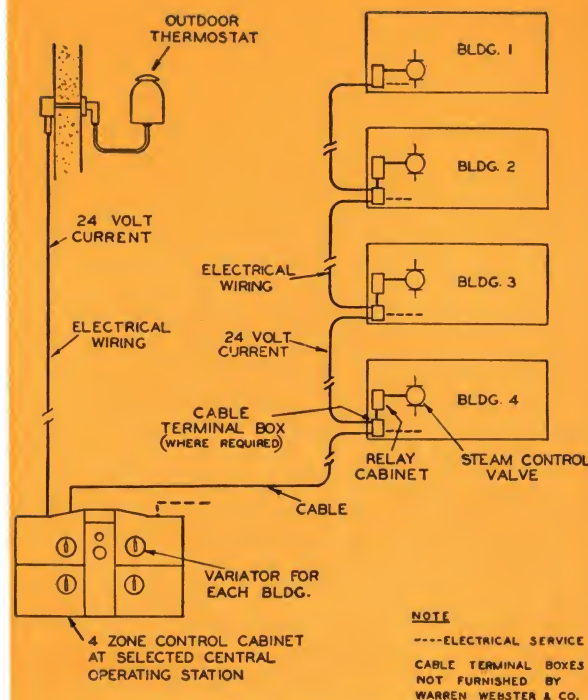


Fig. 9. Diagrammatic Arrangement of Webster Type EH Moderator Control Equipment. Electrical Current (110 Volts, 60 Cycle, A-c.) Is Supplied to Control Cabinet and Each Relay Cabinet for Operation

The correct "on" interval is selected automatically by the Outdoor Thermostat in accordance with the outside temperature. On the Control Cabinet is the Variator which allows operator to manually modify the automatic outdoor control. In effect, this Variator allows operator to increase or decrease steam delivery to take care of weather and occupancy conditions other than outdoor temperature. A Variator is generally provided for each building or zone; however, if a number of buildings have similar heating schedules they can be grouped and controlled with one Variator.

Electric Hylo Control

A pulsating flow control similar to the Type EH Moderator System except that the automatic Outdoor Thermostat is omitted and control is manual or with indoor thermostat or schedule clock, and consequently lower in first cost. Particularly suitable, in single zone form, for smaller buildings taking steam from street mains.



Fig. 10. Webster Type EH Moderator Control Cabinet for Four Zones or Buildings. This Cabinet Is Approximately 37 In. Long, 21 In. High and 13 In. Deep

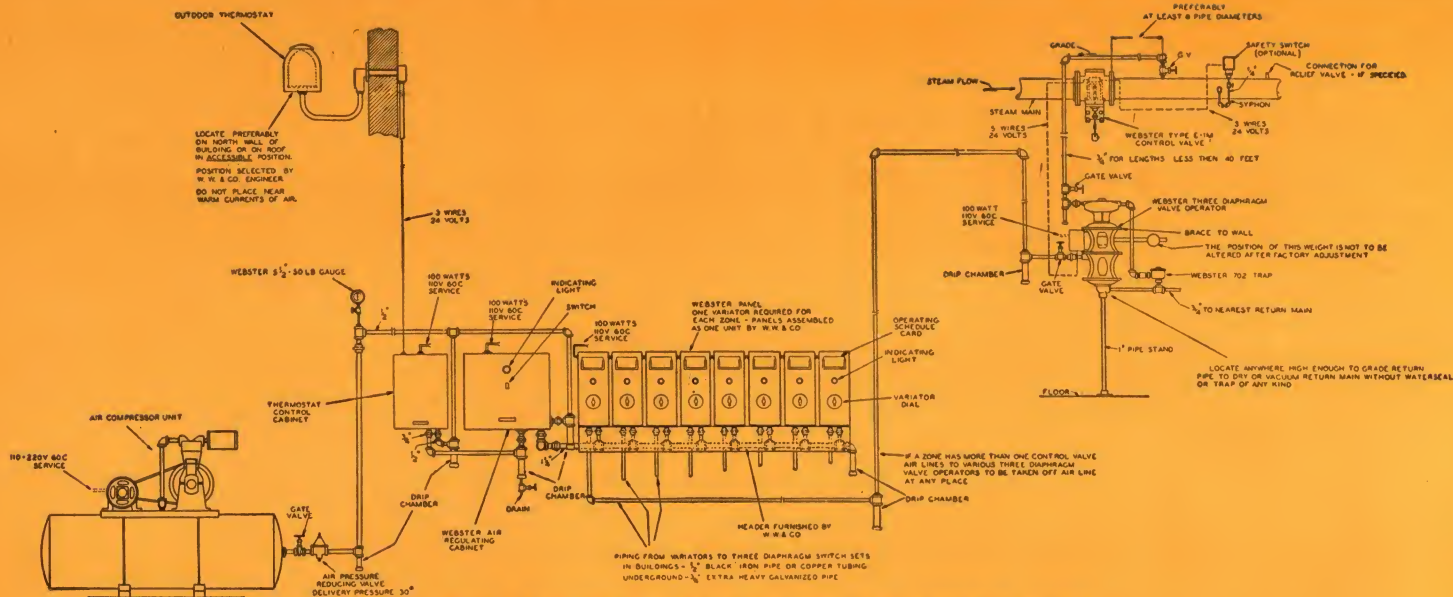


Fig. 11. General Arrangement of Webster Multi-zone Air Moderator Control

WEBSTER AIR MODERATOR CONTROL

The Air Moderator System is a continuous-flow, central control employing compressed air and electricity as mediums for operation. Applicable to large zoned buildings or groups of buildings using two or more main Steam Control Valves. Results in comfort and economy are the same as with other Webster Moderator Controls.

Uses Outdoor Thermostat (see Fig. 5, page 4) to automatically vary the steam supplied to entire heating system (all zones) for changes in outside temperature. Variators, one for each zone, provide supplementary manual control for heating-up, to increase or decrease heat for unusual weather or occupancy conditions, and for shut-off. Each variator (see Fig. 12) includes a lamp which lights when heat is on and a frame for operating schedule cards prepared for each installation. One or more Control Valves can be controlled from each Variator, adjustment of which changes steam flow to all Control Valves in that zone in same proportion. The required number of Variators is furnished assembled as a unit.



Fig. 12. Webster Air Variator. One required for each zone. Each approx. 7 1/2 x 18 x 8 3/8 in. in size

Main Steam Control Valves are Webster Type E-1M and E-1 described on page 4 and in figure 7. Motors energized by 3-diaphragm Valve Operator (Fig. 11) adjust Control Valves. Pressure fluctuations in supply and return mains are compensated for automatically by Valve Operators. An air compressor is furnished where compressed air supply is not already available.

How It Works

Air from compressor (Fig. 11) or other source passes through reducing valve to Thermostat Control Cabinet. Electric Outdoor Thermostat in circuit with motor-controlled air valve produces "pilot" air pressure proportional to outdoor temperature. This "pilot" air pressure controls separate air flow from Compressor through Air Regulating Cabinet to Variators, providing all Variators with air pressure proportional to outdoor temperature. Adjustment of individual Variators changes air pressure to Valve Operators in zone. These Valve Operators adjust Control Valves and thus produce corresponding steam pressure differences in heating system of zone.

Single-Zone Air Moderator System

For application to smaller buildings or groups whose heating requirements can be met by a single Variator and one or more Main Steam Control Valves. Diagrammatic arrangement similar to Fig. 11 except that Air Regulating Cabinet is omitted and only one Variator is employed. Optional equipment includes (1) a snap switch to remotely close Control Valve and (2) an automatic overheat limit indoor thermostat furnished with or without schedule clock.

WEBSTER TYPE SP HYLO STEAM VARIATOR CONTROL

26
45

A Service Bulletin giving complete mechanical details and operation and maintenance instructions is available to supplement this brief description. Ask for Service Bulletin S-941.



Fig. 13. Webster Type SP Hylo Steam Variator Cabinet

Right hand dial is set for outdoor temperature. Left hand dial is usually set at normal but may be increased to 150% of normal for heating-up or reduced to 50% of normal for night or special requirements. Switch in center provides for remote shut-off. A schedule card (in frame at bottom) assists in economical operation. The Type SP Cabinet may be located at a convenient operating point.

A central control system of the graduated, continuous flow type which varies steam supply to the entire heating system in accordance with changes in outdoor temperature. Provides a *simple, rugged and dependable* control for the smaller building. Consists of Type SP Hylo Steam Variator Cabinet (Fig. 13) and Type E-1M Main Steam Control Valve (Fig. 7, page 4). Adjustment of control dials causes motor to adjust Control Valve in steam main (Fig. 15). Ordinary pressure variations in supply and return mains are compensated for automatically by two sensitive diaphragms. Adjustment of temperature dial may be made by reference to thermometer located outdoors, or remote reading thermometer may be mounted near control cabinet. Schedule clock for automatic shut-off or indoor thermostat for automatic overheat limit shut-off are optional.

Applicable to two-pipe orificed systems, either vacuum or vapor, using low pressure steam from any source. May also be applied with minor modifications to directly control stoker motors (Fig. 17), motor operated draft dampers on hand-fired coal boilers (Fig. 16), or blowers.

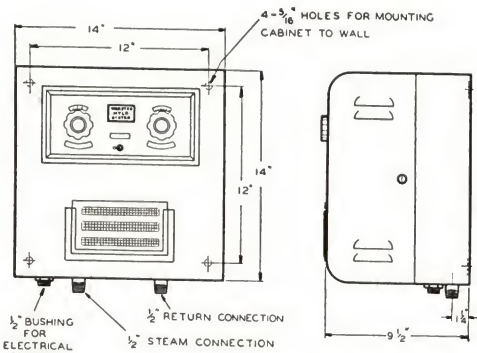


Fig. 14. Dimensions of Control Cabinet, Type SP Webster Hylo Steam Variator

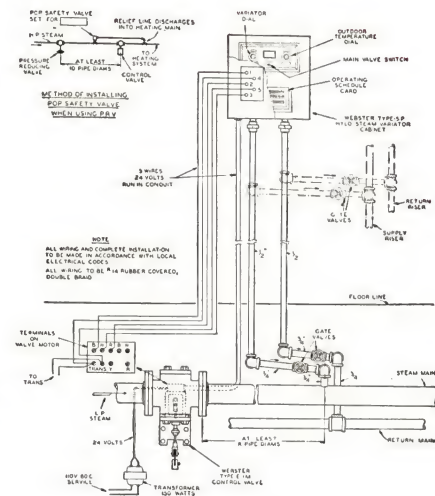


Fig. 15. General Arrangement of Type SP Webster Hylo Steam Variator Controlling Webster Type E-1M Valve

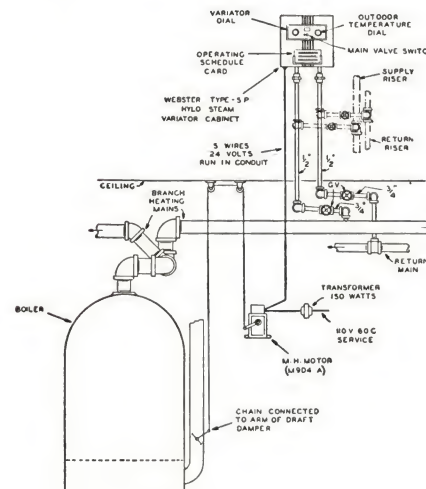


Fig. 16. General Arrangement of Type SP Webster Hylo Steam Variator Controlling Draft Damper on Hand-Fired Coal Burning Boiler. The same arrangement is used when motor operates a modulating type stoker. Here the chain is connected to arm of stoker.

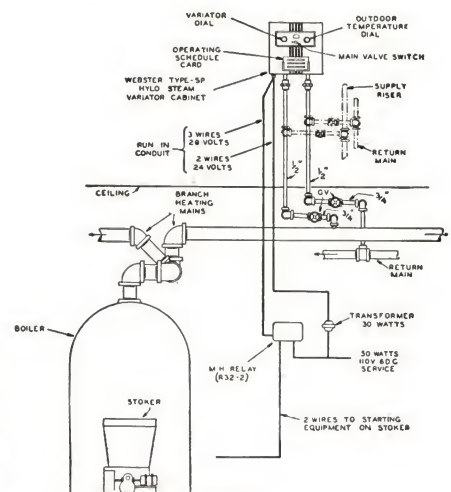


Fig. 17. General Arrangement of Type SP Webster Hylo Steam Variator Controlling "On-and-Off" Type. See Fig. 16 for Modulating Stoker

WEBSTER SYSTEM EQUIPMENT

Used as needed in Webster Systems of Steam Heating and includes the following:

Webster "Three-Point" Radiator Valve

The finest Webster Radiator Valve. Incorporates sleeve orifice feature of improved Webster Systems with choice of open-shut operation or "three-point" providing shut, normal and excess positions. Excess position permits 140% of normal heat in installations with Webster Central Controls. The "Three-Point" feature is especially desirable for hospitals, hotels, apartments and homes where extra flexibility is desired.

Usually shipped for open-shut operation but the "three-point" feature is quickly obtainable by reversing dial plate.

Other design and construction features: Quick-opening non-rising stem, special die-molded ring packing gland which meets usual "packless" specification requirements. Body of high grade cast steam brass and of ample section throughout, no skimping. Nipples in most-used 1/2, 3/4 and 1-inch sizes are machined from solid brass bar stock with strong integrally broached lugs. Union nuts in these sizes also machined from solid brass. Nuts and nipples in little used 1 1/4-inch size are of cast brass. Renewable Jenkins composition disc securely fastened in self-centering disc holder, generous seat dimensions.

Available in angle, right-corner, left-corner and straightway (single union only) models with bakelite wheel handle, or lever, lockshield or extended steam fixtures as shown in Table X and Fig. 23 (except flush handle). Sizes 3/4 and 1 inch only. Dimensions same as corresponding sizes of Webster Type "W" Valves. See Tables I, II and III.

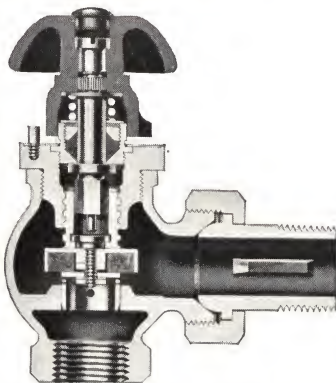


Fig. 18. Webster "Three-Point" Valve

Webster Type "W" Radiator Valve

Same high quality as Webster "Three-Point" Radiator Valve, except that "Three-Point" features are omitted and slotted sleeve or plug included to provide "modulation" in either orificed or unorificed installations. Sizes 3/4 and 1 inch have sleeves; sizes 1/2 and 1 1/4 inch use plugs. Successful "modulation" requires that proper pressure be maintained on system.

All other design and construction features same as "Three-Point" Valve described above.

Available in angle, right-corner, left-corner, straightway single union and straightway double union models with bakelite wheel, lever, lockshield, chain wheel or extension stem handles. Available in sizes and models listed in Tables I, II and III.

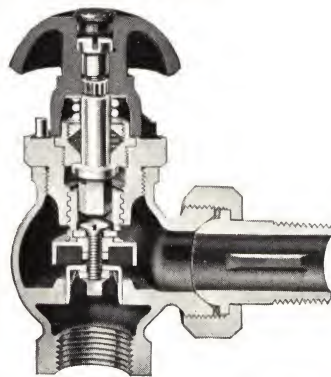
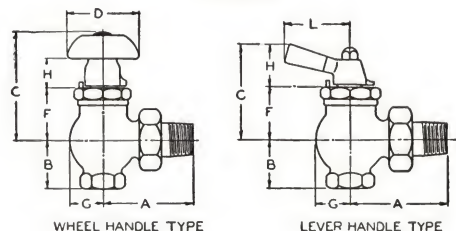


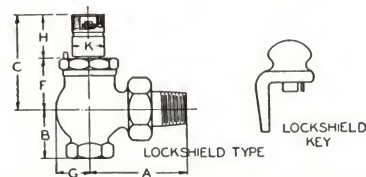
Fig. 19. Webster Type "W" Valve

TABLE I. Dimensions of Webster Type "W" Valves
Angle Body with Wheel (Standard), Lever, and Lockshield Handles



WHEEL HANDLE TYPE

LEVER HANDLE TYPE



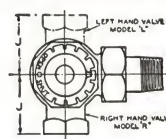
LOCKSHIELD KEY

Size	Symbol	All types				Wheel handle		
		A	B	F	G	C	D	H
1/2"	202H	2 13/16	1 1/4	1 1/2	1	3 5/16	2 1/4	1 5/16
3/4"	203H	2 15/16	1 1/2	1 11/16	1 1/8	3 1/16	2 1/4	1 5/16
1"	204H	3 1/16	1 3/4	1 7/8	1 1/8	4 1/16	3	1 1/4
1 1/4"	205H	3 5/16	2	2 1/8	1 1/2	4 1/16	3	1 1/4

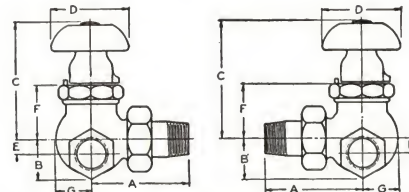
Size	Symbol	Lever handle			Lockshield		
		C	H	L	C	H	K
1/2"	202H	3	1 1/2	2 5/16	2 7/8	1 1/16	1
3/4"	203H	3 3/16	1 5/8	2 5/16	3 1/16	1 1/16	1
1"	204H	3 3/4	1 7/8	2 5/16	3 11/16	1 13/16	1 1/8
1 1/4"	205H	4	1 7/8	2 5/16	3 15/16	1 13/16	1 1/8

All dimensions in inches and subject to slight variation.

TABLE II. Dimensions of Webster Type "W" Valves



Right-corner and Left-corner Bodies with Wheel Handle
See Table I for dimensions of lever and lockshield handles.

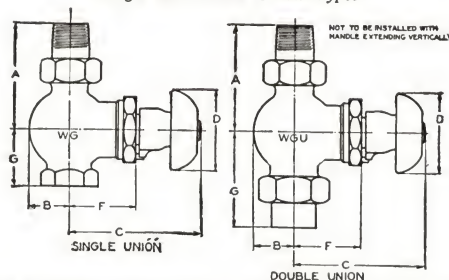


Size	Symbol		A	B	C	D	E	F	G	J
	Right	Left								
1/2"	212R	222L	2 13/16	1 1/8	3 7/16	2 1/4	3 5/16	1 5/8	1	1 1/2
3/4"	213R	223L	2 15/16	1 1/4	3 9/16	2 1/4	3 1/16	1 5/8	1 1/8	1 5/8
1"	214R	224L	3 1/16	1 1/2	4 3/8	3	4 1/16	2 1/16	1 5/16	2

All dimensions in inches and subject to slight variation.

TABLE III. Dimensions of Webster Type "W" Valves
Straightway Bodies with Wheel Handles

See Table I for dimensions of lever and lockshield handles.
Single and Double Union Types

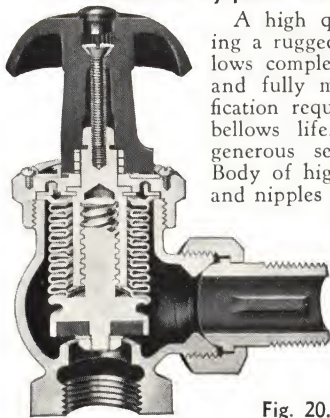


To be installed as shown above with bodies in vertical position

Size	Symbol	A	B	C	D	F	G
Single Union							
1/2"	232G	2 7/8	1 5/16	3 5/16	2 1/4	1 3/4	1 1/2
3/4"	233G	3	1 1/16	3 11/16	2 1/4	1 7/8	1 5/8
1"	234G	3 1/8	1 5/16	4 1/2	3	2 3/16	2
Double Union							
3/4"	243GU	3	1 1/16	3 11/16	2 1/4	1 7/8	2 5/16
1"	244GU	3 1/8	1 5/16	4 3/8	3	2 3/16	2 7/8

All dimensions in inches and subject to slight variation.

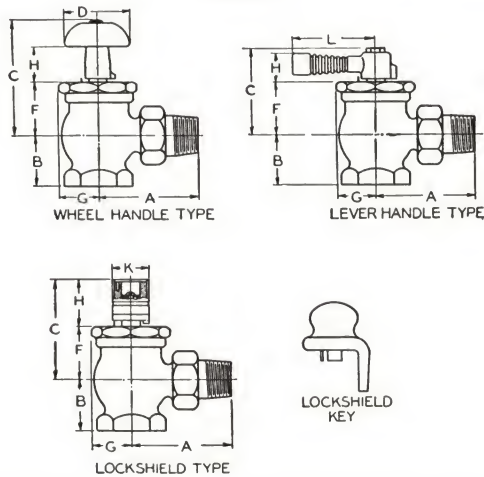
Webster Sylphon Packless Radiator Valve



A high quality radiator valve incorporating a rugged, flexible laminated Sylphon bellows completely enclosing a non-rising stem and fully meeting "bellows packless" specification requirements. Low lift assures long bellows life. Renewable composition disc, generous seat dimensions. Quick-opening. Body of high grade cast steam brass. Nuts and nipples of cast brass. Available in angle, right-corner, left-corner and straightway single union models with choice of wheel, lever, lockshield, chain wheel or extension stem handles. Available in the sizes and models listed in Tables IV, V and VI.

Fig. 20. Webster Sylphon Packless Valve

TABLE IV. Dimensions of Webster Sylphon Packless Valves
Angle Body with Wheel (Standard), Lever, and Lockshield Handles

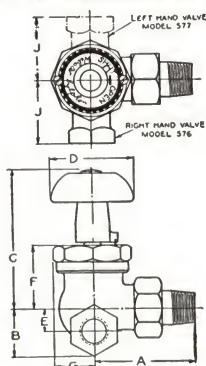


Size	Symbol	All types				Wheel handle		
		A	B	F	G	C	D	H
1/2"	575H	2 5/8	1 1/4	1 5/8	1	3 1/4	2 1/8	1 1/2
3/4"	575H	2 7/8	1 3/8	1 5/8	1	3 3/4	2 1/8	1 1/2
1"	575H	3 1/8	1 3/4	2 1/8	1 1/8	4 1/8	2 5/8	1 5/8
1 1/4"	575H	3 5/8	1 7/8	2 1/8	1 1/8	4 5/8	2 5/8	1 5/8
1 1/2"	575H	3 7/8	2 1/8	2 1/8	1 1/2	4 7/8	3	1 5/2
2"	575H	4 5/8	2 1/2	2 1/8	1 1/2	4 7/8	3	1 5/2

Size	Symbol	Lever handle			Lockshield		
		C	H	L	C	H	K
1/2"	575H	2 5/8	13 1/8	2 1/8	2 1/8	1 1/4	15 1/8
3/4"	575H	2 7/8	13 1/8	2 1/8	2 1/8	1 1/4	15 1/8
1"	575H	3 1/8	13 1/8	2 1/8	3 1/8	1 1/4	15 1/8
1 1/4"	575H	3 5/8	13 1/8	2 1/8	3 5/8	1 1/4	15 1/8
1 1/2"	575H	3 7/8	13 1/8	2 1/8	3 7/8	1 1/4	15 1/8
2"	575H	4 5/8	13 1/8	2 1/8	4 5/8	1 1/4	15 1/8

All dimensions in inches and subject to slight variation.

TABLE V. Dimensions of Webster Sylphon Packless Valves



Right-corner and Left-corner with Wheel Handles

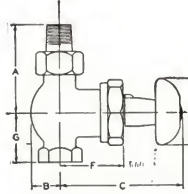
See Table IV for dimensions of lever and lockshield handles.

Size	Symbol		A	B	C	D	E	F	G	J
	Right	Left								
1/2"	576R	577L	2 5/8	1 1/4	3 1/8	2 1/8	3 1/8	1 5/8	1	1 5/8
3/4"	576R	577L	2 3/4	1 1/8	3 1/8	2 1/8	3 1/8	1 1/8	1 1/8	1 3/4
1"	576R	577L	3 1/8	2	4 3/8	2 5/8	1 1/8	2 3/8	1 5/8	2 1/8

All dimensions in inches and subject to slight variation.

TABLE VI. Dimensions of Webster Sylphon Packless Valves

Straightway Bodies with Wheel Handles



See Table IV for dimensions of lever and lockshield handles.

Single Union Type

To be installed only as shown here with body in vertical position

Size	Symbol	A	B	C	D	F	G
1/2"	578G	2 1/8	3/8	3 7/8	2 1/8	1 1/8	1 3/8
3/4"	578G	2 3/8	1	4 1/8	2 1/8	2 1/8	1 3/4
1"	578G	3 1/8	1 1/4	5 1/8	2 5/8	2 1/8	2 1/4

All dimensions in inches and subject to slight variation.

Webster Type "B" Radiator Valve

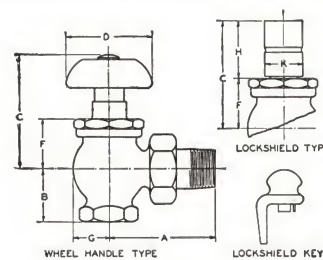
A good quality radiator valve. Quick-opening, non-rising stem, molded ring packing gland meets usual "packless" specification requirements. Steam brass body with forged or cast brass cap. Union nuts and nipples made from bar stock in 1/2, 3/4 and 1-inch sizes; of cast brass in larger sizes. Renewable composition disc securely fastened in disc holder.

Made in angle, left-corner, right-corner, straightway single union and double union body models. Bakelite wheel, lever, lockshield or extended stem handles. Available in sizes listed in Tables VII, VIII and IX.



Fig. 21. Webster Type "B" Radiator Valve

TABLE VII. Dimensions of Webster Type "B" Valves
Angle Body with Wheel (Standard) and Lockshield Handles

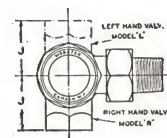


See Table I for dimensions of lever handle.

Size	Symbol	Wheel handle					Lockshield			
		A	B	C	D	F	G	C	H	K
1 1/2"	402H	2 3/4	1 5/8	3	2 1/4	1 5/8	1 5/8	2 5/8	1 1/4	1
3/4"	403H	2 3/4	1 5/8	3	2 1/4	1 5/8	1 5/8	2 5/8	1 1/4	1
1"	404H	3 1/8	1 5/8	3 1/4	2 1/4	1 1/2	1 1/8	2 5/8	1 3/8	1
1 1/4"	405H	3 5/8	1 7/8	4 1/8	3	2 5/8	1 5/8	3 7/8	1 3/8	1
1 1/2"	406H	3 7/8	2 1/8	4 3/4	3	2 1/2	1 5/8	4 1/8	1 3/8	1
2"	408H	4 3/8	2 1/8	4 3/4	3	2 1/2	1 3/4	4 1/8	1 3/8	1

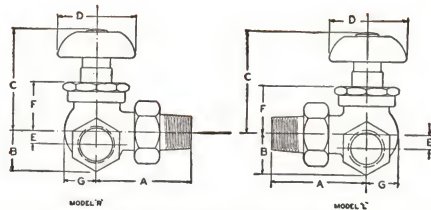
All dimensions in inches and subject to slight variation.

TABLE VIII. Dimensions of Webster Type "B" Valves



Right-corner and Left-corner Bodies with Standard Wheel Handle

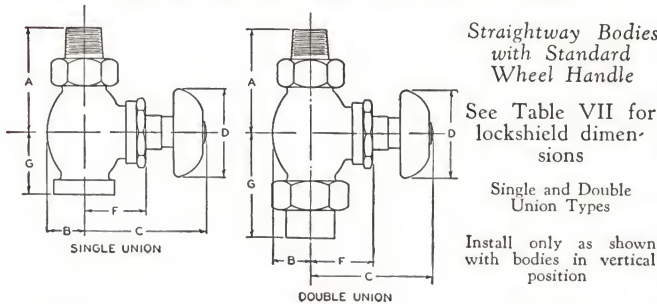
See Table VII for dimensions of lockshield handle.



Size		Symbol		A	B	C	D	E	F	G	J
Inlet	Outlet	Right	Left								
3/4"	1/2"	412R	422L	2 3/4	1 3/8	3	2 1/4	3/8	1 5/16	1 5/16	1 3/8
3/4"	3/4"	413R	423L	2 3/4	1 3/8	3	2 1/4	3/8	1 5/16	1 5/16	1 3/8

All dimensions in inches and subject to slight variation.

TABLE IX. Dimensions of Webster Type "8" Valves



Straightway Bodies with Standard Wheel Handle

See Table VII for lockshield dimensions

Single and Double Union Types

Install only as shown with bodies in vertical position

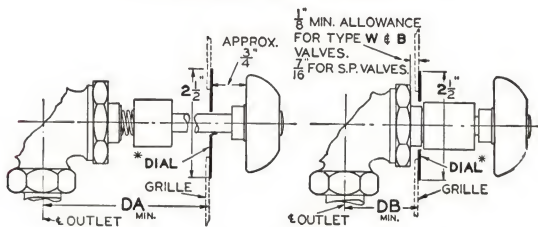
Size		Symbol	A	B	C	D	F	G
Inlet	Outlet							
Single Union								
3/4"	1/2"	432G	3	1	3 1/4	2 1/4	1 7/16	1 5/8
3/4"	3/4"	433G	3	1	3 1/4	2 1/4	1 7/16	1 5/8
1"	1"	434G	3 1/4	1 1/8	3 3/8	2 1/4	1 5/8	1 7/8
Double Union								
3/4"	3/4"	443GU	3	1	3 1/4	2 1/4	1 7/16	2 11/16
1"	1"	444GU	3 1/4	1 1/8	3 3/8	2 1/4	1 5/8	2 13/16

All dimensions in inches and subject to slight variation.

Radiator Valve Symbols

To indicate choice of handle, prefix symbols in Tables I to IX incl., with letter "W" for wheel handle, "L" for lever handle, "LS" for lockshield, "C" for chain wheel (Fig. 22). For Long Stem Type (Table X) use "ES" and for Extended Stem (Fig. 23) use "E" in addition to symbol for handle, i.e., ESW402H.

TABLE X. Dimensions of Special Long Stem Handles for All Types of Webster Supply Valves



*STANDARD DIAL has plain satin finish without marking. Special graduated dial made up on order at extra cost.

Size	Minimum Distance for DA			Minimum Distance for DB		
	Model (see below)			Model (see below)		
	H	G & GU	R & L	II	G & GU	R & L

"W" and "Three-Point" Valves

1/2"	3 1/8	3 1/8	3 1/8	1 7/8	1 7/8	1 3/4
3/4"	3 3/8	3 3/8	3 3/8	1 13/16	2	1 13/16
1"	3 1/2	4 1/8	4	2	2 1/8	2 1/8
1 1/4"	4 1/8	...	...	2 1/4	...	...

"B" Valve

1/2" & 3/4"	2 1/8	3 1/8	2 1/8	1 7/8	1 1/4	1 7/8
1"	3	3 3/8	...	1 7/8	1 3/4	...
1 1/4"	4 1/8	...	...	2 7/8	...	...
1 1/2" & 2"	4 3/8	...	...	3 1/8	...	...

Sylphon Packless Valve

1/2"	2 7/8	3 1/4	2 1/8	2	2 3/8	2 1/8
3/4"	3 1/8	3 1/8	3	2 1/8	2 3/8	2 1/8
1"	3 3/8	4 1/4	3 1/2	2 1/8	3 3/8	2 1/8
1 1/4"	3 7/8	...	...	2 1/8	...	...
1 1/2"	3 7/8	...	...	2 3/4	...	...
2"	3 7/8	...	...	2 3/4	...	...

All dimensions in inches and subject to slight variation.

†On 1-in. Type W Valves, Model GU, the minimum DA is 4 1/4-in. and the minimum DB is 2 7/8-in.

Model H is angle body; Model G is straightway single union; Model GU straightway double union; Model R is right-corner; Model L is left-corner.

Supply Valve Handles



Fig. 22. Chain Wheel Handle

The wheel ("mushroom") handle of Bakelite is furnished with Webster Supply Valves unless another type is specified. Lever handle or lockshield cover as shown in the dimension tables will be furnished upon request.

Special attachments include a chain wheel with a 6 ft. chain drop for radiators installed beyond reach (see Fig. 22). For certain types of enclosed radiation, Special Long Stem Handles or Extended Stem Fixtures are used. The Long Stem Handle (Table X) is rigid and is used chiefly where handle must be at a short distance from valve. Available in wheel, lever or lockshield types. The Extended Stem Fixture (Fig. 23) will operate to a maximum of 15° from vertical and is used chiefly where handle is on top of radiator enclosure. In Fig. 23 view 1 is the wheel handle, 2 and 3 are top and side views of the flush-type handle, 4 and 5 are the key and lockshield cover while 6 is the lever handle.



Fig. 23. Extended Stem Fixtures for Webster Supply Valves

Pressures—Webster Radiator Valves are for use with low pressure Webster Systems of Steam Heating where boiler pressures do not generally exceed 2 lbs. per sq. in. However, Webster Valves will not be detrimentally affected by occasional pressures up to 25 lbs. per sq. in.

Selection of Valves for Unorificed Webster Systems

The ratings given in Table XI, following, apply to all Type "W," Type "B," Sylphon Packless and Double Service Valves when used *without* orifices in Standard Webster Systems.

TABLE XI. Ratings of Unorificed Webster Supply Valves in Sq. Ft. E.D.R.

Valve size, in.	Residences, small buildings, Type "R" system	Large buildings, schools, apart- ments, factories, Type "R" or Vacuum System
	Press. diff.—4 oz.	Press. diff.—8 oz.
1/2	35 sq. ft.	50 sq. ft.
3/4	80 sq. ft.	110 sq. ft.
1	130 sq. ft.	185 sq. ft.
1 1/4	225 sq. ft.	315 sq. ft.
1 1/2 & 2	320 sq. ft.	450 sq. ft.

Selection of Valves for Orificed Webster Systems

The schedule of valve sizes given in Table XII, following, apply to all Type "W," "Three-Point," Type "B," Sylphon Packless and Double Service Valves when used with orifices in Improved Webster Systems.

TABLE XII. Ratings of Orificed Webster Supply Valves in Sq. Ft. E.D.R.

Valve size, in.	A—Standard	B—Optional
	Sq. ft. E. D. R.	Sq. ft. E. D. R.
1/2	0-50	0-35
3/4	Above 50-110	Above 35-80
1	Above 110-185	Above 80-130
1 1/4	Above 185-315	Above 130-225
1 1/2 & 2	Above 315-450	Above 225-320

Direct Radiators—With Orificed Systems, the supply valves of radiators are provided with a cup, push-seat, nipple or sleeve-orifice, the latter as in the "Three-Point" Valve. Valves should be selected of such size that practically no pressure drop occurs through the valve itself. Steam delivery then depends upon the size of the orifice and the pressure difference across it. The suggested sizes in Table XII-A can be used for most installations. There may be applications where it is desirable to have valve sizes larger. Occasionally a larger valve may be preferred for appearance. In such cases, Table XII-B may be used.

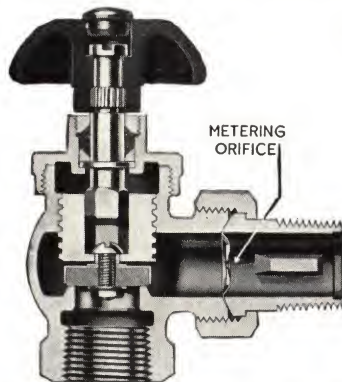


Fig. 24. Cup-type Metering Orifice Used in Radiator Supply Valve

The size of orifices, to be installed at each radiator is selected by the engineers of the nearest Webster branch office, who are equipped with complete data to make possible a proper selection.

The discs for cup, push-seat and nipple-type orifices are of heavy gauge Monel Metal to resist erosion and corrosion, amply thick to be free from vibration and shaped for silent operation. The sleeve-type orifice as furnished with the Three-Point Valve (Fig. 18) is

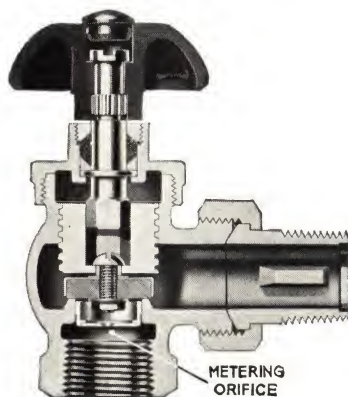


Fig. 25. Push-seat Metering Orifice Used in Radiator Supply Valve

Webster Metering Orifices

These are discs with a restricted opening, the size of which is determined by the amount of radiation, the distance (equivalent pipe length) of the radiator from the source of supply and, in tall buildings, the effect of altitude.

The size of orifices, to be installed at each radiator

of brass. For concealed radiators and convectors, for special applications, for existing installations using earlier types of Webster Valves and for all valves of other makes these Orifices may be obtained in both standard and special types, to meet conditions and permit low cost modernization. Some of these types are shown in Figs. 27 and 29.

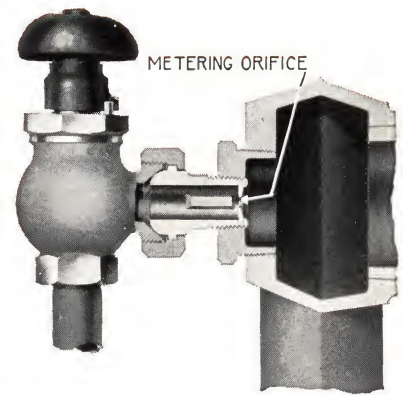


Fig. 26. Metering Orifice in Nipple of a Webster Supply Valve

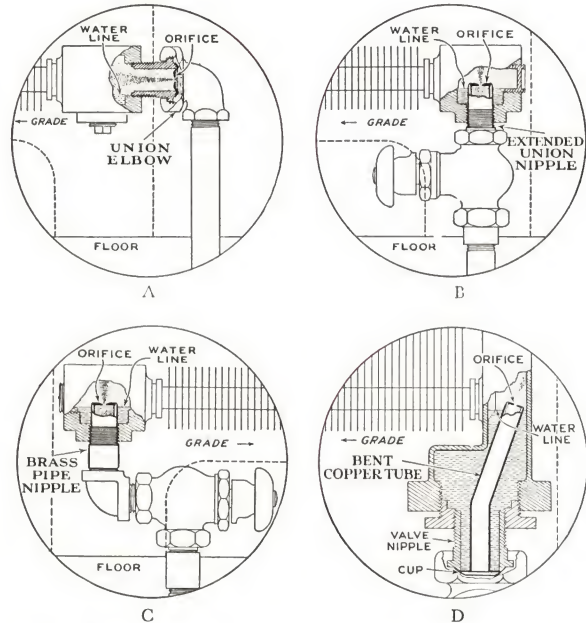


Fig. 27. These Special Webster Orifice Fittings Are Used for Concealed Radiation

Sketch A shows a standard cup-type orifice in a union elbow applied to cabinet radiation with end connections when supply valve is located below basement ceiling. Sketches B and C show method of orificing concealed radiation having bottom connections. In Sketch B, the orifice is furnished in an extended union nipple. In Sketch C it is furnished in a bent copper tube. Sketch D illustrates a Special Bent Tube Orifice used with concealed radiators having off-set type headers.

Intermediate Metering Orifices

Provided for installation in branch mains to assist in primary distribution. Made of brass plate and provided with two attached copper asbestos gaskets and suitable lugs for mounting in pipe lines between union flanges and between companion flange and gate valve. They are supplied on special order in standard pipe sizes between 2 in. and 12 in. inclusive.

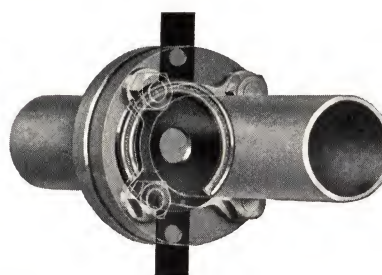


Fig. 28. Webster Intermediate Metering Orifice between union flanges

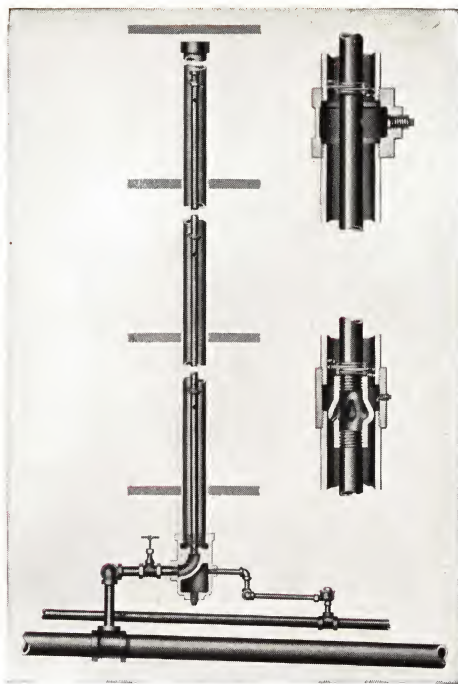


Fig. 29. Webster Inner-Tube Heating Risers (Patented)

Are used in place of ordinary heating risers for bathrooms, kitchens and small rooms of apartments, dormitories, etc. in conjunction with Improved Webster Systems and Webster Central Controls, reducing installation cost without sacrificing operating economy or comfort. Two concentric pipes are installed with a Webster Heating Riser fitting at base of up-feed or top of down-feed riser. Centering springs are installed to properly locate inner pipe. The properly-sized metering orifice openings are drilled into inner pipe at each floor level. Riser heating is thus controlled by fractional filling exactly as with orificed radiators in Webster centrally-controlled systems. Only a small portion of riser surface will be heated in mild weather, larger portion as outdoor temperature becomes lower.

Webster Double Service Valve

Combines thermostatic trap with quick-opening valve. Simplifies piping in down-feed risers in one-story buildings. Acts as trap for down-feed riser and as a radiator supply valve. Metering orifices can be furnished when used with Improved Webster Systems. Wheel handle is standard; lever and lockshield types available on special order. For Ratings see Tables XI and XII. A separate bulletin giving further details of the Webster Double Service Valve is available to supplement the brief description here. Ask for Bulletin 722-C.

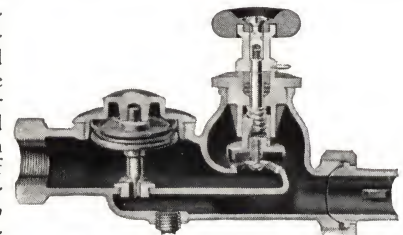


Fig. 30. Webster 174 Double Service Valve

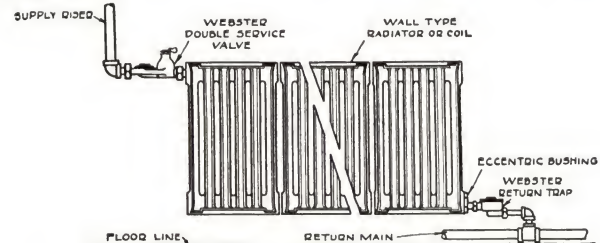


Fig. 31. Application of Webster Double Service Valve

TABLE XIII. Dimensions of Double Service Valves

Size	Symbol	A	B	C	D	E	G
3/4"	173	3 1/4	7/8	4 3/8	2 1/4	1	4 3/8
1"	174	3 3/4	1 1/8	5 3/8	2 3/8	1	5 3/8
1 1/4"	175	4 1/8	1 5/8	6 3/8	3 1/8	1 5/16	6 3/8
1 1/2"	176	4 7/8	1 7/8	6 7/8	3 3/8	1	6 7/8

All dimensions in inches and subject to slight variation.

TABLE XIV. Rated Capacities of Webster Low Pressure Traps

(For press. difference across trap in lb. per sq. in.) select trap by rating, not by pipe size. For Improved Webster Systems using metering orifices, it is recommended that the selection of traps be based on 1/4 lb. per sq. in. press. difference.

Size	Symbol	Press. diff. in lb. per sq. in.									
		1/10	1/4	1/2	1	1 1/2	2	5	10	15	25
Sylphon and Series "7" Traps in Sq. Ft. E.D.R.											
1/2"	502 and 702	55	85	120	165	200	235	370	530	640	....
3/4"	503 and 703	55	85	120	165	200	235	370	530	640	....
1/2"	512 and 712	105	165	230	330	400	465	730	1050	1300	....
3/4"	513 and 713	105	165	230	330	400	465	730	1050	1300	....
3/4"	523 and 723	185	290	410	580	700	810	1280	1840	2300	....
1"	534 and 734	315	500	710	1005	1200	1420	2270	3110	3900	....
Series "7-M" Traps in Sq. Ft. E.D.R.											
1/2"	702-M	55	85	120	165	200	235	370	530	640	840
3/4"	703-M	55	85	120	165	200	235	370	530	640	840
1/2"	712-M	105	165	230	330	400	465	730	1050	1300	1640
3/4"	713-M	105	165	230	330	400	465	730	1050	1300	1640
3/4"	723-M	185	290	410	580	700	810	1280	1840	2300	2900
1"	734-M	315	500	710	1005	1200	1420	2270	3110	3900	5070

In above table ratings are given Equivalent Direct Radiation (E.D.R.) based on 240 B.T.U. per sq. ft. per hour.

Series 26 Heavy Duty Drip Traps in Lbs. Water per Hour

3/4"	00026-T and O	50	75	100	145	170	200	285	370	430	....
1"	0026-T and O	160	250	350	500	600	700	1000	1300	1500	....
1 1/4"	026-T and O	330	510	660	920	1030	1200	1500	1850	2250	....
1 1/2"	126-T and O	540	840	1200	1720	2060	2400	3800	5400	6700	....
2"	226-T and O	1080	1720	2450	3500	4300	5000	7800	11100	13600	....

No allowance made for pressure drop in the connecting piping between radiation and trap or from trap through run-out to return.

CONVERSION FACTORS: To convert ratings given in lb. per hour of water to sq. ft. E.D.R. at 240 B.T.U., multiply by 4. To convert ratings given in sq. ft. E.D.R. at 240 B.T.U. to lb. per hour of water, divide by 4.

Webster Traps

A number of different types of low pressure traps are provided for use in Webster Systems to discharge condensation and air from radiators, drips, unit heaters, blast radiation, etc., giving a choice to meet every operating condition.

Webster Syphon Trap

Original and highly perfected type of low pressure thermostatic bellows trap. Effectively discharges all condensation and entrained air from radiators or coils without permitting passage of steam. Operation is by means of a liquid contained in the rugged Syphon Bellows. Stainless steel cone valve and renewable sharp-edged stainless steel seat. Factory adjusted, and made in 1/2, 3/4 and 1 in. sizes. Maximum pressure 25 lb. per sq. in. For normal operating pressures not exceeding 15 lb. per sq. in.

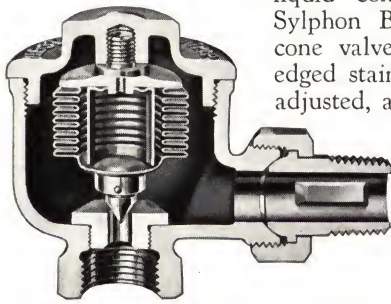
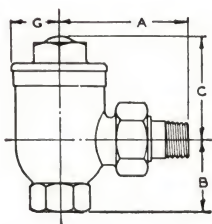


Fig. 32. Webster 502 Syphon Trap

See Table XIV for ratings.

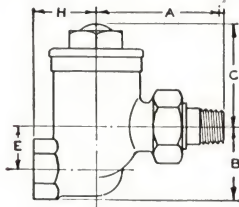
TABLE XV. Dimensions of Webster Syphon Traps
Angle Bodies (Symbol H)



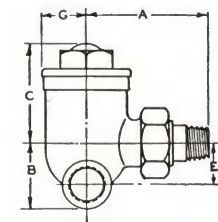
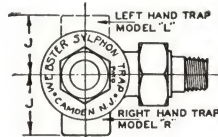
Size	A	B	C	G
1/2" - 502	2 3/4	1 1/8	1 15/16	1 3/8
1/2" - 502HS	2 3/4	1 15/16	1 15/16	1 3/8
1/2" - 512	3 1/8	1 5/8	2 5/8	1 3/8
3/4" - 503	3 1/8	1 5/8	1 15/16	1 3/8
3/4" - 513	3 1/8	1 5/8	2 5/8	1 3/8
3/4" - 523	3 3/8	1 5/8	3 5/16	1 3/8
1" - 534	4	2 5/8	3 5/16	1 3/4

All dimensions in inches and subject to slight variation.
*Has 3/4-in. outlet.

Right-corner (R), Left-corner (L) and Straightway (G) Bodies



All dimensions in inches and subject to slight variation.



Size	A	B	C	E	G	H	J
1/2" - 502	2 3/4	1 1/2	1 15/16	3/4	1 3/8	1 13/16	1 7/8
1/2" - 502S	2 3/4	1 1/2	1 15/16	3/4	1 3/8	1 13/16	1 7/8
1/2" - 512	3 1/8	1 1/2	2 3/8	1	1 1/2	1 13/16	2 1/8
3/4" - 503*	3 3/8	1 5/8	1 15/16	7/8	1 1/8	1 13/16	...
3/4" - 523*	3 3/8	2 7/8	3 5/16	1 1/4	1 1/8	1 13/16	...

*Made in straightway (G) body only. †Has 3/4-in. outlet.

Webster Series "7" Return Trap—A perfected diaphragm-type thermostatic trap unusually strong in construction. A notable record of trouble-free service (over 1,700,000 installed) has led to its adoption by hundreds of architects and engineers. Uses as operating member a triple-sealed, phosphor bronze diaphragm. Important feature is stainless steel cone valve and renewable sharp-edged stainless steel seat. Each trap is individually adjusted

and tested at factory. Made in 1/2, 3/4 and 1 in. sizes. Maximum pressure —25 lb. per sq. in. For normal operating pressures not exceeding 15 lb. per sq. in. See table XIV for ratings.

Webster Series "7-M" Trap—Used where normal operating pressures will prevail up to 25 lb. per sq. in. Maximum occasional pressure is 50 lb. per sq. in. The series "7-M" Trap is similar to the Standard Series "7" Type but has been still further reinforced to meet the higher pressures by heavy gauge monel metal diaphragm as well as stainless steel cone valve piece and seat insert. See Table XIV for ratings.

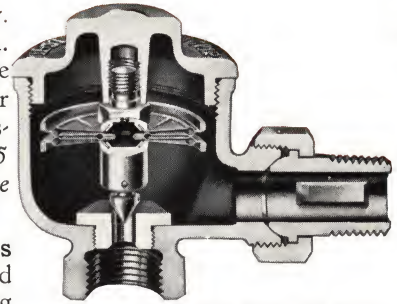
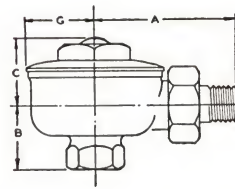


Fig. 33. Webster Size 702 Trap

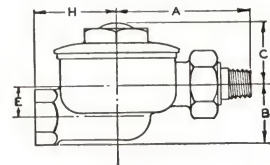
TABLE XVI. Dimensions of Webster Series "7" and "7-M" Traps
Angle Bodies (Symbol H)



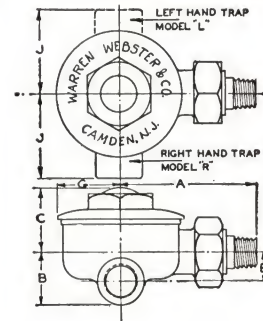
Size	A	B	C	G
1/2" - 702	2 3/4	1 1/8	1 15/16	1 3/8
1/2" - 702HS	2 3/4	1 15/16	1 15/16	1 3/8
1/2" - 712	3 1/8	1 5/8	2 5/8	1 3/8
3/4" - 703	3 1/8	1 5/8	1 15/16	1 3/8
3/4" - 713	3 1/8	1 5/8	2 5/8	1 3/8
3/4" - 723	3 3/8	1 5/8	3 5/16	1 3/8
1" - 734	4 3/8	2	2 5/16	1 3/4

All dimensions in inches and subject to slight variation.
*Has 3/4-in. outlet.

Right-corner (R), Left-corner (L) and Straightway (G) Bodies



All dimensions in inches and subject to slight variation.



Size	A	B	C	E	G	H	J
1/2" - 702	2 3/4	1 1/8	1 15/16	3/4	1 3/8	1 13/16	1 7/8
1/2" - 702S	2 3/4	1 1/8	1 15/16	3/4	1 3/8	1 13/16	1 7/8
1/2" - 712	3 1/8	1 5/8	2 5/8	1	1 1/2	1 13/16	2 1/8
3/4" - 703*	3 1/8	1 5/8	1 15/16	7/8	1 1/8	1 13/16	...
3/4" - 723*	3 3/8	1 5/8	3 5/16	1 1/4	1 1/8	1 13/16	...

*Made in straightway (G) body only. †Has 3/4-in. outlet.

Webster Series 26 Heavy Duty Drip Traps

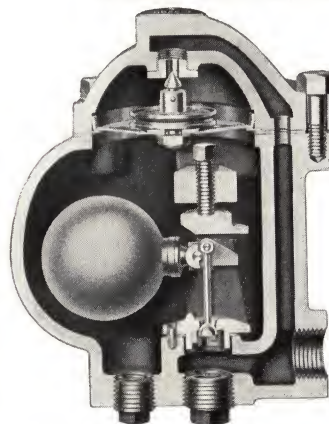


Fig. 34. Webster Size 0026-T Heavy Duty Drip Trap

Series 26-T—Heavy duty traps, capable of handling large volumes of condensation and air, and at the same time compact and light in weight. Suited for drips of mains, blast radiation, unit heaters, hot water generators, fan heater coils, and similar applications. The specification calling for a heavy duty, float-type trap is fully met, while the advantages of the thermostatic element and ease of installation are both re-

26
45

tained. Side outlet opening of ample size permits the discharge of water, or water and air. In the bottom of the trap are plugged clean-out openings. The most used sizes (00026, 0026, 026) incorporate the *outward opening seat* feature.

A choice of two inlet openings in opposite sides of body and two outlet openings at bottom is provided in sizes 0026 and 026. Size 00026 has one inlet opening and one outlet on cover plate. Light in weight, so that it may be handled easily and mounted in pipe line without other support. Sizes 126 and 226 have single end inlets and outlets. These larger sizes require a supporting bracket when installed. Maximum working pressure, 15 lb. per sq. in. See table XIV for ratings.

Series 26-O—Similar to the Model 26-T Drip Trap but without thermostatic element. Used where concentration of air does not occur, such as on ends of mains and risers, flash tanks and dripping gravity heating systems into vacuum return lines. Provision is made for external air by-pass.

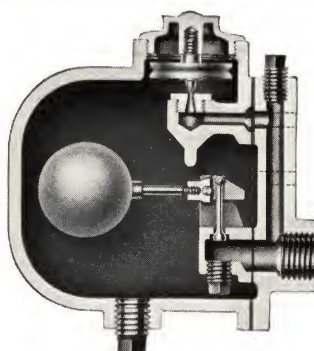


Fig. 35. Webster Heavy Duty Drip Trap, Size 00026-T

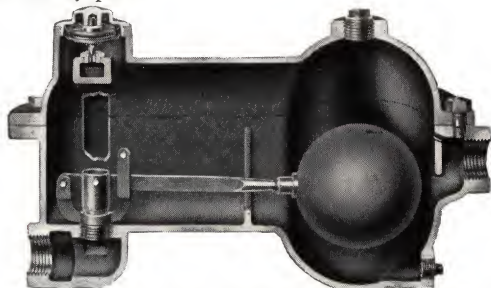
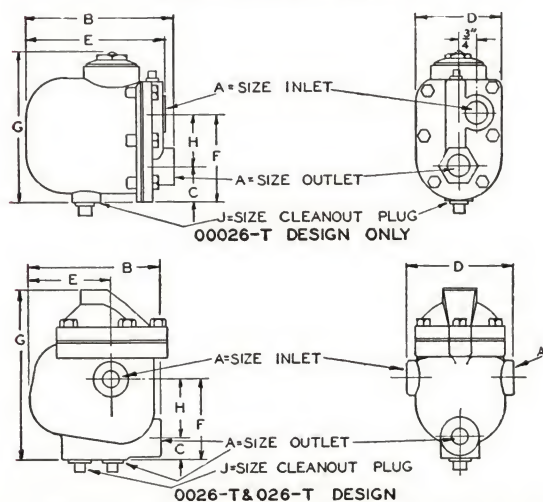


Fig. 36. Webster Size 126-T Heavy Duty Drip Trap

TABLE XVII. Roughing-in Dimensions of Webster Series 26 Heavy Duty Drip Traps



Symbol	A	B	C	D	E	F	G	H	J
00026-T	3/8	6 5/8	1 1/2	3 3/4	6 1/8	3 7/8	6 5/8	2 3/8	1 1/2
00026-O	3/4	6 5/8	1 1/2	3 3/4	6 1/8	3 7/8	6 5/8	2 3/8	1 1/2
0026-T	1	6 3/8	1 1/8	4 1/2	3 15/16	3 15/16	8 1/8	2 13/16	1
0026-O	1	6 3/8	1 1/8	4 1/2	3 15/16	3 15/16	7 1/8	2 13/16	1
026-T	1 1/4	8 1/8	2 1/2	5 1/8	4 7/8	5 5/8	9 13/16	3 1/8	1 1/4
026-O	1 1/4	8 1/8	2 1/2	5 1/8	4 7/8	5 5/8	8 7/8	3 1/8	1 1/4

All dimensions in inches. Subject to slight variation.

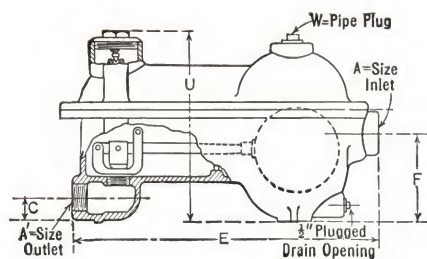


Fig. 37
Size 526
Dirt Pocket



Fig. 38. Size 782
Dirt Strainer

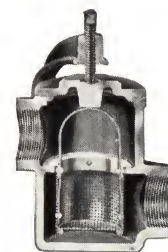


Fig. 39. Size 118-A
Dirt Strainer

Webster Dirt Strainers and Pockets

Placed in return lines of steam heating systems to catch dirt, rust, scale and other particles, preventing them from impairing the tightness of traps. More dependable than pockets made of pipe and fittings, cost less to install, and are more readily cleaned.

Where the probability of dirt is greater than normal, Series 18 Dirt Strainers should be used in place of Series 26 Dirt Pockets.

Maximum working pressure, 15 lb. per sq. in., except Series "78," which is 125 lb. per sq. in.

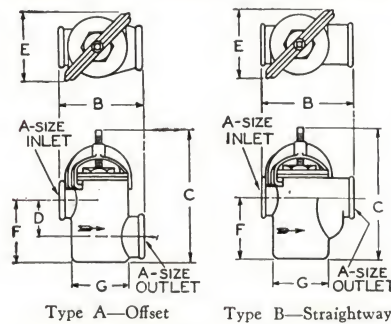


TABLE XIX. Dimensions of Webster Series 18 Dirt Strainers

Symbol	A	B	C	D	E	F	G
018-A	1/2 or 3/4	3 1/2	6	1 3/4	2 3/4	2 3/4	2 1/2
118-A	1 or 1 1/4	4 3/4	7 1/8	2	3 1/2	3 1/2	3 1/4
218-A	1 1/2 or 2	6	9 1/8	3	4 3/4	4 3/4	4 1/4
018-B	1/2 or 3/4	3 1/2	6	1 3/4	2 3/4	2 3/4	2 1/2
118-B	1 or 1 1/4	4 3/4	7 1/8	2	3 1/2	3 1/2	3 1/4
218-B	1 1/2 or 2	6	9 1/8	3	4 3/4	4 3/4	4 1/4

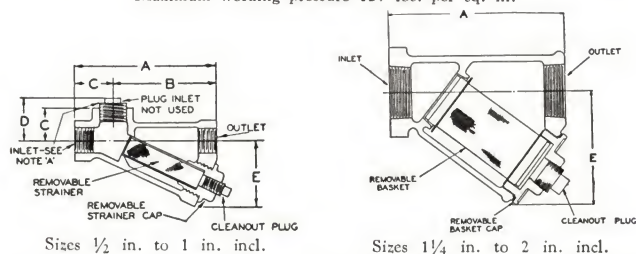
All dimensions in inches and subject to slight variation.

TABLE XX. Dimensions of Webster Series "26" Dirt Pockets

Symbol	A	B	C	D	E	F	G	H	J
526	1 1/4	1	1	3/4	1 3/4	1 3/4	1 7/8	1	6 7/8
826	2	1 1/4	1 1/4	1	2 1/8	1 5/8	2 3/8	1 1/2	7 7/8
1026	2 1/2	1 1/4	1 1/2	1 1/4	2 5/8	1 3/4	2 3/4	1 5/8	9 1/4
1226	3	1 1/4	1 1/2	1 1/4	3 1/4	1 3/4	3 1/4	1 7/8	10 5/8

All dimensions in inches and subject to slight variation.

TABLE XXI. Dimensions of Webster Series "78" Dirt Strainers
Maximum working pressure 125 lbs. per sq. in.



Symbol	Tappings		Dimensions				
	Inlet	Outlet	A	B	C	D	E
782	1 1/2	1 1/2	4 1/2	3 3/8	1 1/8	1 1/2	2 1/4
*782-B	1 1/2	1 1/2	4 1/2	3 3/8	1 1/8	1 1/2	2 1/4
783 and 783-B	3/4	3/4	4 1/2	3 3/8	1 1/8	1 1/2	2 1/4
784 and 784-B	1	1	5 1/2	4 1/8	1 1/8	2 1/2	3 1/4
785 and 785-B	1 1/4	1 1/4	5 1/2	4 1/8	1 1/8	2 1/2	3 1/4
786 and 786-B	1 1/2	1 1/2	6 1/4	5 1/8	1 1/8	2 1/2	3 1/4
788 and 788-B	2	2	7 1/8	6 1/8	1 1/8	2 1/2	3 1/4

*Available also with 3/8 in. inlet and outlet.
B Models have cast brass body, nickel-plated all over, polished trim. Other models have painted cast-iron bodies.

Webster Traps for "Process Steam"

Series "78"—A Thermostatic trap used to discharge air and water from heating coils and any apparatus using steam at process pressures, i. e., 10 to 125 lb. per sq. in. Built in four sizes: 3/8, 1/2, 3/4 and 1 in. There are two classes: Class 2 for pressures of 10 to 60 lb. and Class 3 for pressure of 60 to 125 lb. Steam brass body and cover. Nickel plated with polished trim. Monel metal diaphragm. Stainless steel valve piece and seat insert.

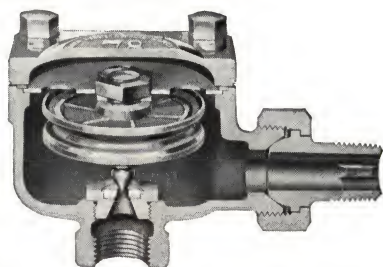


Fig. 40. Webster Size 782 Trap

TABLE XXII. Dimensions of Webster Series "78" Traps

No. of trap	Inlet		Outlet		A		B		C		G	
	1	2	1	2	1	2	1	2	1	2	1	2
780†	3/8	3/8	3/8	3/8	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
782*	1/2	1/2	1/2	1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
783	3/4	3/4	3/4	3/4	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
784	1	1	1	1	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2

†780 Trap furnished with 3/8-in. female nipple on special order. Dimension A = 2 3/4 in.

*782 Trap furnished on special order with 3/8-in. male nipple, also 3/8-in. or 1/4-in. female nipple to fit standard 1/2-in. union nut. Dimension A = 3 3/8 in.

NOTE—780 Trap has screwed cap; other sizes, bolted cap.

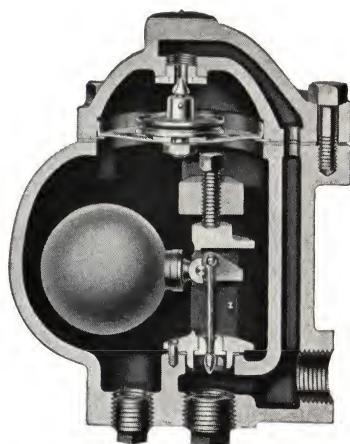


Fig. 41. Webster 794-T Trap

vent unit is thermostatic element of Webster 780 Trap.

Series "79"—Float-and-thermostatic traps designed for normal working pressures between 15 and 125 lb. per sq. in. For use where large volumes of very hot condensate must be handled more quickly than is possible by thermostatic traps alone. Condensate is passed through float-controlled outward opening valve while air is discharged into return piping through thermostatic vent and integral bypass. Compact and light and readily mounted in a pipe line without other support.

Cast iron body, copper-asbestos gasket, and cover are bolted together with steel cap screws. Valve piece and stem are Monel Metal while seat is Stainless Steel. Air

Made in four pressure classifications as shown in Table XXIV, the only difference being in the size of the float-controlled valve seat opening. Model 794-O without thermostatic vent is available. Roughing-in dimensions same as Size 0026-T Trap in Table XVII. Available with either 3/4 in. or 1 in. inlet and outlet.

TABLE XXIII. Rated Capacities of Webster Series "78" Traps*

Size of trap	Class 2—Working pressures up to 60 lb. per sq. in.											
	Pressure differential, lb. per sq. in.											
	1	5	10	20	30	40	50	60	80	100	125	
	Lb. water per hour											
3/8"—780	6	20	33	53	70	88	100	120	145	170	200	
1/2"—782	14	40	64	100	130	158	180	205	245	283	330	
3/4"—783	31	90	142	225	290	350	400	460	550	640	740	
1"—784	70	200	315	490	640	770	900	1000	1204	1400	1620	

Class 3—Working pressures up to 125 lb. per sq. in.

3/8"—780	4	13	22	36	48	60	70	80	99	115	135
1/2"—782	11	32	51	80	105	128	148	165	200	230	270
3/4"—783	25	72	112	178	230	280	325	360	440	500	580
1"—784	56	162	255	402	530	640	730	830	1000	1170	1350

*Pressure differentials given in this table refer to pressure at inlet of trap and in return line. Select trap to handle maximum condition. For normal working pressures up to 60 lb. per sq. in., use Class 2 Traps even though occasional pressures may go above 60 lb. For normal pressures between 60 lb. and 125 lb., use Class 3 Traps. In this table ratings are given above 60 lb. for Class 2 Traps and below 60 lb. for Class 3 Traps merely to show performance at these special pressures.

TABLE XXIV. Rated Capacities of Webster Series "79" Traps in Lb. Water per Hour

Symbol	Pressure differential in lb. per sq. in.											
	1	5	15	25	30	40	50	60	80	90	100	125
Class 2A—Working pressures 15 to 30 lb. per sq. in.												
794-T-2A	460	1030	1790	2280	2540							
Class 2B—Working pressures 30 to 60 lb. per sq. in.												
794-T-2B	260	590	1020	1270	1440	1660	1860	2020				
Class 3A—Working pressures 60 to 90 lb. per sq. in.												
794-T-3A	130	290	510	650	720	840	940	1020	1200	1260		
Class 3B—Working pressures 90 to 125 lb. per sq. in.												
794-T-3B	68	150	260	350	370	450	500	520	640	660	700	759

Important Note—A very complete engineering data book on process steam application and use of Webster Series "78" and "79" Traps is available to supplement the brief description above. Write for Webster Bulletin B-1200C.

Webster Series 23-A Heavy Duty Traps

For use at steam pressures up to 50 lb. per sq. in. Float-type heavy duty trap for large quantities of condensate. Does not include integral air vent. Air may be vented by petcock, or through a Webster 780 Class 2 Trap located in an external by-pass. Available in 1, 1 1/2 and 2-inch sizes.

Webster Vacuum Pump Governor

Used to govern flow of steam to steam-driven vacuum pumps. Maintains a constant degree of vacuum in return mains and prevents pump from racing, if vacuum in return mains should be lost. Has cast iron frame and body. Rubber composition diaphragm. Steel spring. Brass body, double seated valve.

Standard valve furnished for pressures up to 150 lb. per sq. in. Special valve available for pressures over 150 lb. and under 200 lb. or for superheat. Valves range in size from 3/4 inch to 3 1/2 inches inclusive. Write for Bulletin B-708B.

Webster Suction Strainers

Installed ahead of vacuum pump to prevent dirt and scale, brought down with condensation from heating system, from damaging pump with resultant troubles.

A tapping is provided for introduction of cold water make-up when that is desired; another for connection to a vacuum gauge. Made of heavy cast iron with flanged connections. Companion flanges included as standard. Clean-out cover is bolted on with rubber gasket joint. Screen basket is made of sheet brass with No. 4 holes (.045 in. dia.), 225 holes per sq. in. and is easily removable for cleaning. Maximum working pressure, 15 lb. per sq. in. Write for Bulletin B-709B.

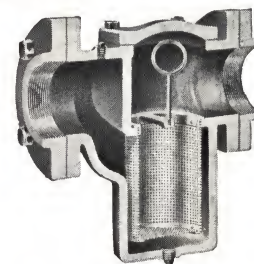


Fig. 42. Webster Suction Strainer

Webster Type "Y" Strainer

For use on water lines to remove sediment, hair, leaves, etc., and thus protect pumps and other machinery. Used extensively for swimming pools and supply lines of railroad water tanks. Exact duplicate of Suction Strainer except screen basket which is of heavier material and has No. 11 holes (0.1 in. dia.) and 49 holes per sq. in. Write for Bulletin B-709B.

Webster Lift Fittings

The improved design of Webster Lift Fittings makes possible quicker starting of the lift and retains all the advantages of the earlier design.

Used in pairs where condensation is to be lifted to a higher level. More efficient than "lifting pockets" made of standard fittings; require less time, and cost less to install.

Sizes $\frac{3}{4}$ to 8 in. Made of cast iron. Maximum working pressures 15 lb. per sq. in. or 29 in. of vacuum. Write for Bulletin B-713C.

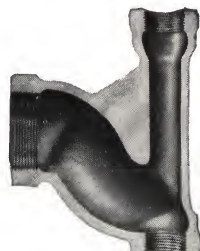


Fig. 43. Webster Lift Fitting

Webster Air Separating and Receiving Tanks

Used with Webster Vacuum Systems for storage of condensate discharged by the vacuum pump and for liberation of air that comes over with this condensate. For working pressures up to 30 lb. per sq. in. Tanks available in three sizes handling up to 32,000 lb. water per hour. Standard cylindrical shell of steel plate with flat flanged heads. Electro-welded throughout. Connections are steel pipe sockets welded in place. Four types: plain, water-control, steam-control, and hydro-pneumatic. Write for Bulletin B-714B.

Webster System Gauges

Compound steam gauges employing the Bourdon tube principle. Accuracy in the range of operating pressure (10 in. vacuum to 5 lb. pressure) assured by a patented retard design. Dial is graduated to read from 30 in. vacuum to 30 lb. pressure with 1 oz. intervals from 0 to 5 lb. and $\frac{1}{2}$ in. intervals from 0 to 10 in. vacuum.

Enclosed in steel case finished in crystal black. Nickel plated flared ring surrounding dial. Zero adjustment accomplished by slotted screw on the dial face. Internal siphon eliminates unslightly exposed siphon and protects Bourdon tube from steam temperatures.

Furnished in two sizes: a $3\frac{1}{2}$ in. dial with $\frac{1}{8}$ in. male bottom connection and a 5 in. dial with $\frac{1}{4}$ in. male bottom connection. Non-retard type gauge furnished in 5 in. size when desired. Write for Bulletin B-730.

Webster Hylo Controller

Individual buildings of a group or individual sections of a building served by a single source of vacuum may require different degrees of vacuum for proper steam circulation. Use of Webster Hylo Controllers and related equipment provides means to maintain different yet constant degrees of vacuum at various points throughout the heating system. Once adjusted it is not necessary to change the Controller as it automatically maintains proper circulation. Write for further information.

Webster Water Accumulators

Placed in pipe line connecting diaphragm of pressure reducing valve to steam main. Provide a large volume of water between diaphragm and main to (1) prevent damage to diaphragm because of high temperatures and (2) assure a practically constant static head of water which eliminates fluctuations in static pressure.

Made of cast iron in two sizes. Maximum working pressure 15 lb.

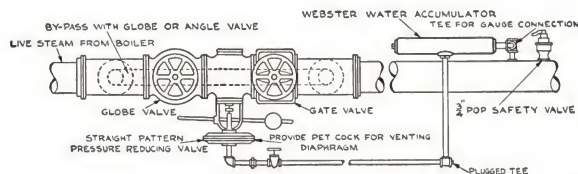


Fig. 44. Method of Installing Straight Pattern Pressure Reducing Valve Using Webster Water Accumulator

TABLE XXV. Dimensions of Webster Water Accumulators

Symbol	A	B	C	D	E
235	18 $\frac{3}{4}$	4	3 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$
236	21 $\frac{1}{4}$	7 $\frac{1}{2}$	4 $\frac{3}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{16}$

All dimensions in inches and subject to slight variation.

Webster Expansion Joints

Webster Expansion Joints are constructed with cast iron bodies and brass slip sleeves, and in both single and double slip types. The bodies of Webster Expansion Joints are provided with anchors integral with the body castings. Service connections are provided for convenience in tapping the steam main for branch piping. Drip outlets are also provided.

Made in three classes: (1) For working pressure of 15 lb. per sq. in.; (2) for 125 lb. per sq. in.; (3) for 150 lb. per sq. in.

Sizes range from $1\frac{1}{2}$ to 20 in., according to class.

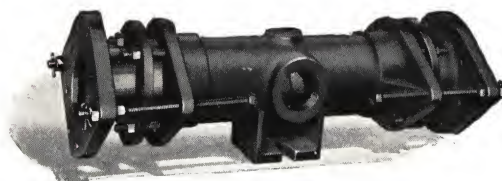


Fig. 45. Webster Expansion Joint

Webster Steam Separators

Remove excess condensation from live steam lines and thus protect engines, turbines, pumps, compressors, and other steam-driven apparatus from damage due to this excess water. Made in both horizontal and vertical types. Vertical type especially used as a receiver at engine throttle to absorb pulsations in steam flow. Horizontal type effective in removing water from compressed air lines.

Made as one-piece iron casting for maximum pressure of 200 lb. per sq. in. Sizes from $1\frac{1}{2}$ in. to 12 in. inclusive.

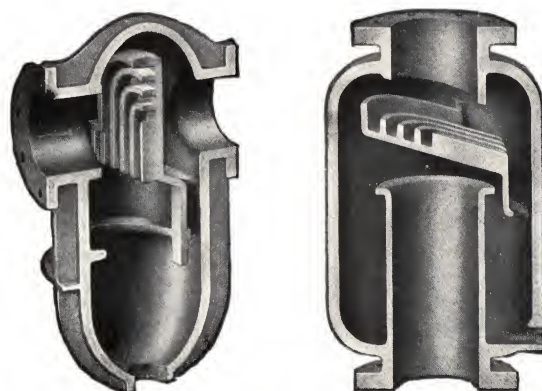


Fig. 46. Webster Steam Separators. Horizontal Type at Left, Vertical Type at Right

Webster Oil Separators

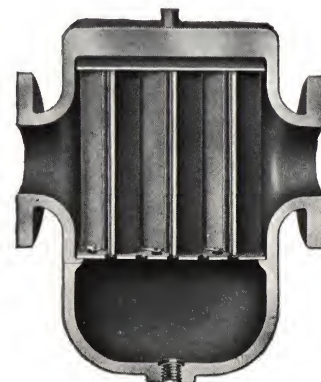
Placed in exhaust steam lines to remove cylinder oil from steam before latter is condensed and used for boiler feed, or for direct heating of water.

Body and cover are cast iron. Steel baffles of the double-hook, multi-baffle type. Entire interior is removable through handhole for cleaning and inspection.

Horizontal type made in sizes $1\frac{1}{2}$ in. to 16 in. inclusive; Vertical type in sizes 3 in. to 10 in. inclusive. Maximum working pressure, 15 lb. per sq. in.

At right:

Fig. 47. Webster Oil Separator Horizontal Type



WEBSTER TYPE R SYSTEM EQUIPMENT 26

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Service Bulletin S-650D giving complete mechanical details of the Webster Type "R" System is available to supplement the brief description on this page. Popular "Don Graf" Data Sheets are also available for those desiring information in that form.

Quick circulation, despite variations in boiler pressures, is assured in Webster Type "R" Systems through the combination of the Webster Boiler Return Trap and Vent Trap. Air escapes from the system through the Webster Vent Valve. Water returns direct to the boiler by gravity at low pressures. An increase of pressure causes the Webster Boiler Return Trap to fill and operate, equalizing the pressure and making positive the prompt return of water to the boiler. Units are made to provide five sizes of the Webster Boiler Return Trap and Vent Trap combination, having the range of capacities given in Table XXVI.

Each Type "R" Combination should include a Webster Series 78 Dirt Strainer and (2) Webster 45° Check Valves.

Webster Boiler Return Trap

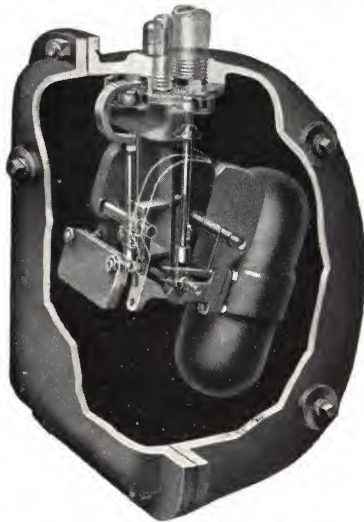


Fig. 48. Webster Size 023 Boiler Return Trap

Positive acting, reciprocating device for returning water to boilers in Webster Type "R" Systems. Construction is shown in Fig. 48. The float is of heavy gauge metal with no exposed seams. The entire mechanism is held in place by two studs and is removable as a unit. It turns on a single Monel Metal shaft. Steam valve opens quickly when high level is reached. No wire drawing. Valves are all-metal and self-aligning. Operation is silenced by stainless steel bumper springs.

Webster Vent Trap with Vent Valve

Used in conjunction with the Webster Boiler Return Trap, to provide a dependable method of removing air from heating systems and automatically preventing its return, at the same time making overflow of condensation impossible.

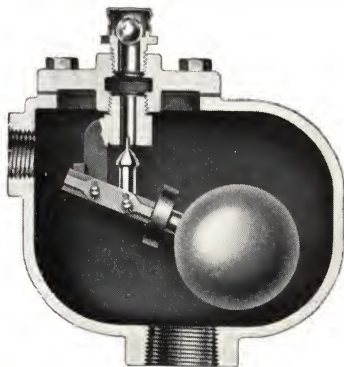


Fig. 49. Webster Size 123A Vent Trap with Separate Vent Valve. Sizes 223A and 323A Are Similar

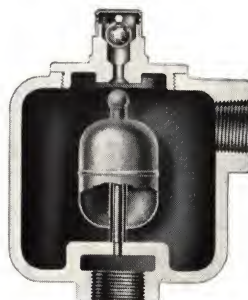


Fig. 50. Webster 0023A Vent Trap with Integral Vent Valve

Webster Damper Regulator

Controls and maintains pressure of only a few ounces. Used with hand-fired, anthracite coal-burning low pressure boilers in

Webster Vacuum and Type "R" Systems when normal operation is from 2 ounces to a maximum pressure of 2 lb. per sq. in. at boiler. Applicable in stoker-fired installations *only in exceptional cases* when damper regulation controls air supply damper; with oil-burners *only when throttling type burner is used.*

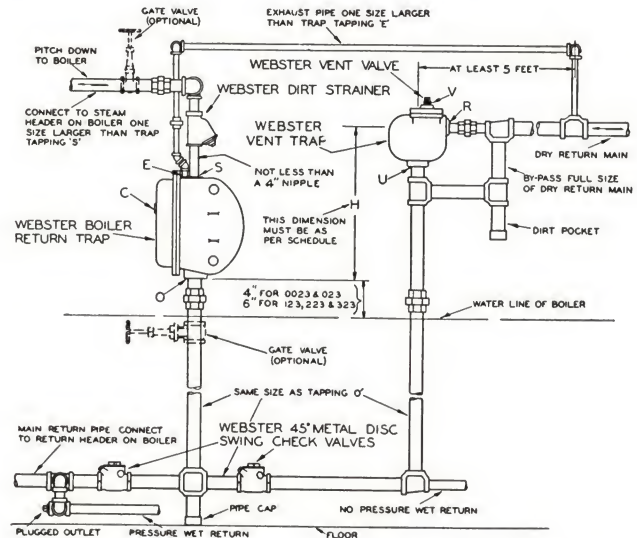


Fig. 51. Conventional Arrangement of Webster Type "R" System Equipment. Gate Valves Are Optional

TABLE XXVI. Data and Ratings for Webster Type "R" System Basement Equipment (Refer to Fig. 51)

Rating sq. ft. dir. rad.	Size Boiler Return Trap	Tappings			Size Vent Trap	Num- ber of 3/8-in. Vent Valves	Tappings			Dimen- sion H	Size Dirt Strainer	Size Check Valves (2 Req'd)
		E	O	S			R	U	V			
0-1500	0023	1/2	1 1/4	3/4	0023A	1	1	1 1/4	1 1/2	14	783	1 1/4
1501-2500	023	1/2	1 1/2	1 1/4	123A	1	1 1/4	2	2 1/2	17	785	1 1/2
2501-4000	123	1/2	2	1 1/4	123A	1	1 1/4	2	2 1/2	19	785	2
4001-8000	223	3/4	2 1/2	1 1/2	223A	2	1 1/4	2 1/2	3	23	786	2 1/2
8001-16000	323	3/4	3	1 1/2	323A	3	1 1/4	2 1/2	1	26	786	3

*Bushed—2"x1 1/2". †Integral Vent Valve.

All dimensions in inches and subject to slight variation.

Webster Boiler Protector

Provided to prevent breakage in low pressure cast iron boilers when the water level becomes inadequate. Automatically feeds to boiler when water level drops to 1 in. above bottom of gauge glass. Body is made of cast iron with three principal parts bolted together. Interior parts of copper, brass or Monel Metal to withstand corrosion. Seamless float actuates Monel Metal cone pilot valve on sharp-edged Monel Metal seat. Water valve with special Jenkins composition disc actuated by difference in water pressure between exterior and interior of Syphon Bellows.

Adapted to almost all types of low pressure heating boilers where maximum pressure will not exceed 15 lbs. per sq. in. Maximum cold water main pressure should not exceed 150 lb. per sq. in.; minimum must not be less than 25 lb. per sq. in.

Made in one size, Model 34 with 3/4-in. connections. Also Model 34C-1 with electrical cut-out switch.

Catalog B-727B and instruction bulletin available on Webster Boiler Protection.

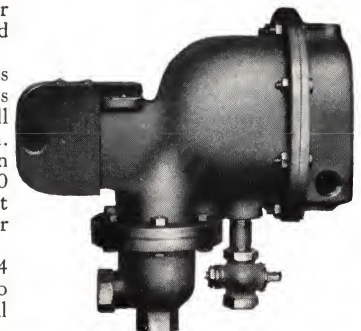


Fig. 52. Model 34C-1 Webster Boiler Protector, with Electrical Cut-out Switch

WEBSTER SYSTEM RADIATION

Concealed Non-Ferrous Type

A complete catalog is available to supplement the brief description shown here. It includes complete descriptive information, illustrations, details on results in installations, complete dimension data and certified rated capacities. Ask for Bulletin B-1500B.

Webster System Radiation is designed for use exclusively with Improved Webster Systems of Steam Heating. It cannot be used for hot water heating or one-pipe vapor or steam systems. Webster System Radiation is a logical development of the experience gained by Webster engineers in their work of assuring proper application and utilization of Webster System Equipment with many different types of radiation.

Webster System Radiation is far more than just another type of light-weight radiation. It combines in a single unit, a light-weight heating element of high efficiency with an orificed radiator supply valve, a radiator trap, and supply and return piping connections. This unit is entirely concealed by an accompanying metal enclosure which is furnished with the unit for installation within the wall. This unique combination of elements not only reduces the space requirements to a minimum but greatly simplifies installation and, in addition, places the responsibility for the correct functioning of all of these closely related items in the hands of one well-established manufacturer.

Webster System Radiation and enclosures are so designed that the entire heating element can be readily removed without damage to plaster or other structural materials.

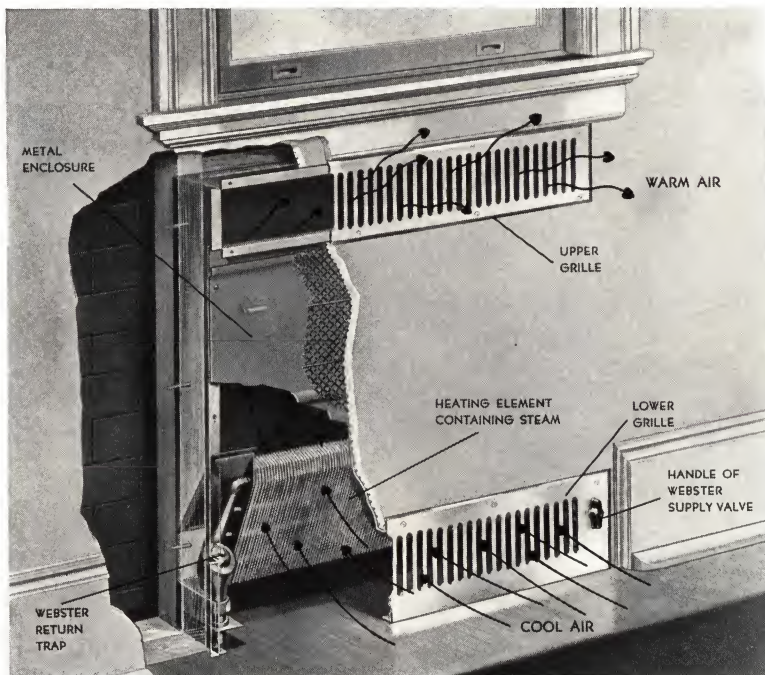


Fig. 53. How Webster System Radiation Heats the Room by Natural Circulation

Air from room is drawn in through lower grille and passes upward over heating element. As its temperature is raised air ascends and re-enters room through upper grille. As warm air gives up its heat by contact with objects in room and by mixture with cooler air, its temperature drops and it falls to floor level where it re-enters lower grille. Note supply valve handle outside lower grille, enabling room occupant to turn on or completely shut off heat

(Type AK Radiator Illustrated)

ing element and return trap in a single unit eliminates considerable roughing-in work, simplifies piping and reduces installation labor cost.

Enclosures

The requirements of widely varied architectural treatments and building construction are met without preparation of special architectural detailed drawings by one of the following types of Webster System Radiation:

(1) Type AK—For concealing within plaster, panel, tile, marble, stone, and other surfaced walls.

(2) Type AKT—Similar to Type AK Enclosure except having a No. 12 gauge, $\frac{3}{4}$ in. square mesh, horizontally positioned top outlet grille.

(3) Type AM—Metal cabinet for enclosing within wall but having metal panel cover.

(4) Type AE—Free standing exposed cabinet.

(5) Type AEH—Hung type exposed cabinet.

Other types such as special institutional enclosures are available. Information upon request.

Provision has been made in all types of enclosures for positive control of heat by extending Webster Supply Valve handle through lower grille or opening. The handle is of pleasing shape and has been placed in an inconspicuous location yet is easily operable if room occupant desires to turn on or shut off heat.

Description

Enclosures are of heavy gauge, cold rolled (furniture) steel finished in baked prime coat. Provided with holes for nailing to studding. May be installed back of any wall surface. No special framing or furring required. Length of enclosure is total length of recess—unnecessary to add for valve and trap connections. Fixed support for heating element integral with enclosure eliminates necessity for adjustment or legs.

Heating Element

—Entirely non-corrosive materials. Designed for complete drainage. Flat surfaced fins prevent lodging of dust and dirt. Element installed on an angle to provide maximum heat per unit of space occupied. Tubes and headers connected by Mueller Streamline Joints.

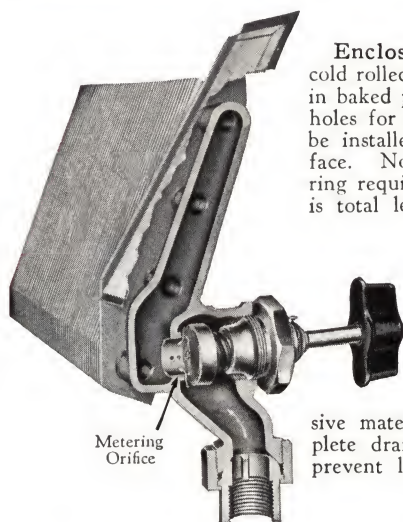


Fig. 54. Cut-away View of Supply Header Showing Webster "Three-Point" Valve including metering orifice

Webster Three-Point Supply Valve with Sleeve-Type Metering Orifice incorporated in each unit. For detailed description of these features see pages 2 and 8.

Union Connections—For both steam and return are furnished as part of the radiator. Units furnished left-hand or right-hand but not convertible.

Metal Grilles—Of pleasing bar type design.

Webster Trap—Built into return header. Phosphor bronze diaphragm, removable sharp-edged seat, 60° cone valve piece.

Ease of Installation—The combination of supply valve, heat-



Fig. 55. Cut-away View of Return Header

Complete drainage from all tubes provided for by raceways around valve seat.

WEBSTER-NESBITT UNIT HEATERS

26
45

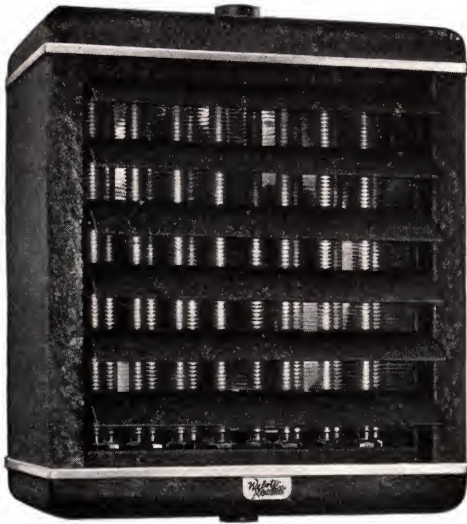


Fig. 56. Front View of Propeller-Fan, Ceiling-Suspension Type Webster-Nesbitt Unit Heater



Fig. 57. Rear View of Webster-Nesbitt Unit Heater Showing Motor Mounting, Motor, and Propeller Fan

Webster-Nesbitt Unit Heaters are manufactured by John J. Nesbitt, Inc., Holmesburg, Philadelphia, Pa., and are distributed solely through Warren Webster & Company, Camden, New Jersey.

Webster-Nesbitt Propeller-Fan Unit Heaters provide a method of heating small- and medium-size enclosures such as stores, offices, garages, factories, and other structures having comparatively low ceilings. For the heating of large spaces the Webster-Nesbitt Centrifugal-Fan Giant Heater is recommended.

Webster-Nesbitt Unit Heaters are designed to circulate large volumes of air at comparatively low temperatures. By this method the heated air is mixed thoroughly with the room air to reduce overheating in upper areas and temperature stratification, and to assure quick heating, low fuel costs, and great comfort for room occupants.

Propeller-Fan Unit Heater

A ceiling-suspended unit that combines attractive appearance and quiet operation. Casings are constructed of heavy furniture steel, die-formed and welded, with black featherweave finish and stainless steel trim. Heating element is constructed of die-formed copper fins mechanically forced over $\frac{3}{4}$ inch seamless copper tubes forming a tight and permanent joint. Connection between tubes and steam and return headers is made with compression unions. Both headers are constructed of heavy, seamless, rectangular steel tubing, with connection couplings and tube bosses are welded to heater body. Heating element and headers are free to expand within the casing.

Steam and return connections are located in center of headers permitting support directly from steam piping in smaller sizes. In the larger sizes it is preferable to use hanger rods.

Fans are of the four-blade type designed to handle maximum volume of air with the minimum noise. In the Series 12, 16 and 20 units, which are specifically designed for quiet service, the fans have exceptionally wide overlapping blades of gradual pitch to reduce eddy current and blade tip noises. Discharge louvers are individually adjustable and, once properly set, may be fastened in position.

All motors are provided with rubber-isolated bases that prevent transmission of motor hum or vibration to unit casing or piping. Motor support brackets are of steel tubing welded to casing and motor base plate, and are designed for low resistance to air flow.

Sizes and Capacities—Webster-Nesbitt Propeller-Fan Unit Heaters are made in six distinct casing sizes, and with air capacities at maximum fan speed increasing progressively from 860 c.f.m. to 4950 c.f.m. For each of the six sizes there are available three heating elements affording a wide range in final temperature for given air volume. This feature permits of flexibility in the selection

of units for varying steam pressures or entering-air temperatures and fan speeds.

All heating assemblies are individually tested at the factory and guaranteed for working steam pressures up to 150 lb. per sq. in.

Write for Bulletin W-N 100 for complete description and information for selection and application.

Centrifugal-Fan Giant Heater

Recommended for the economical heating of large areas. Floor-mounted, wall-mounted, and ceiling-suspended types are available. Available with and without Thermadjust Temperature Control Damper which minimizes overheating and stratification, and effects substantial fuel savings.

Like the Propeller-Fan Unit, the Giant Heater is a product of high quality from the sturdy, efficient copper tube-and-fin radiators to the durable yet attractively designed casings.

Belt drive from motor is standard equipment. Direct-connected motors through flexible couplings can be furnished at additional cost.

Sizes and Capacities—Giant Heaters can be selected from a number of sizes and capacities ranging from 1895 c.f.m., 124,000 B.t.u., to 22,200 c.f.m., 1,350,000 B.t.u., with 2 lbs. steam and 60 degrees entering air.

Write for Bulletin W-N 102 for complete information.

Ratings

All ratings of Webster-Nesbitt Unit Heaters are based on tests made in accordance with the standard test code of Industrial Unit Heater Association and American Society of Heating and Ventilating Engineers.

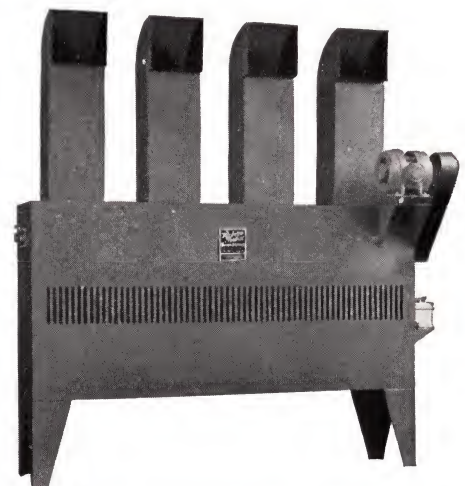


Fig. 58. The Webster-Nesbitt Centrifugal-Fan Giant Heater Is Available in a Full Range of Capacities for Heating Large Interiors

WARREN WEBSTER & COMPANY

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Cable Address: DELPHIC, U. S. A.

Darling Brothers, Ltd., P. O. Box 940, Montreal, Canada, Licensees and Manufacturers

WE solicit consideration for Webster Systems, Controls and Equipment by architects, engineers and building owners on the basis of an enviable record of service, backed by 49 years of experience (since 1888), an ample modern plant and resources, and sales and service offices in over 60 United States cities and in Canada. Webster Systems have been specified by fully one-third of the country's leading architects, and installed in more than 70,000 outstanding structures by more than 2,800 heating contractors. The greater portion of the Company's business consists of repeat orders. Webster engineers are prepared and able to co-operate effectively with architects.

Products and Services

"A Heating System for Every Need and Purpose" including Improved Webster Vacuum and Type "R" Systems of Steam Heating.

Effective central controls for Heating Systems including Webster MODERATOR Controls ("Control-by-the-Weather") and Webster HYLO Controls.

Webster System equipment including Concealed non-ferrous Radiation, Radiator Supply Valves, Return Traps, Drip and Heavy Duty Traps, Dirt Strainers, Boiler Return Traps, Vent Traps, Boiler Protectors, Damper Regulators, Lift Fittings, Expansion Joints, Vacuum Governors, Air Separating Tanks, etc. Series "78" and "79" Traps for process pressures (10-125 lbs. per sq. in.). Unit Heaters.

Webster Systems of Steam Heating

Webster Systems of Steam Heating are complete systems of steam circulation. WARREN WEBSTER & COMPANY manufacture for use in these systems, the products previously listed. It should be noted, however, that the Company does not manufacture, sell or assume responsibility for combustion equipment (oil burners, stokers, etc.), boilers, piping or other equipment not of its own manufacture. These should be selected and specified by the architect in the usual way.

A Heating System for Every Need and Purpose

Heating requirements vary so widely that no one type of heating system or no one control can be expected to provide comfort, economy and maximum investment return for all types and sizes of buildings. Realizing this, WARREN WEBSTER & COMPANY have consistently developed an entire group of Webster Systems of Steam Heating together with effective central controls—each built to meet certain conditions, each a combination of service, experience, equipment and engineering methods for the heating requirements of the individual installation.

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